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ORIGINAL COMMUNICATIONS.

I.

A Dissertation *on* Cynanche Trachealis, *or* Croup, *read before the State Medical Society of New-York, by* John Stearns, M. D. &c. *of Albany, in a letter to* David Hosack, M. D. *New-York.**

Although Doctor Home was the first systematic writer upon this disease, yet that it was known long before his time, we have the most satisfactory evidence in the writings of the ancients.

His opinion of its proximate cause has been sanctioned by the authority of names whose infallibility it would be almost deemed heresy to question. But however hazardous the attempt, or hopeless the success, I shall not hesitate to offer an opinion totally at variance with the one which he advanced, and which has since been universally adopted by the *fashionable* adherents to authorities. And here, permit me to observe, that it is with much satisfaction that I have

* In the essay on croup, inserted in vol. ii. of the Register, some notice was given of the opinions of Dr. Stearns: our readers have now an opportunity of seeing, at large, his *peculiar* views of this important disease.—*Ed.*

read a number of recent publications upon this subject, by men eminent for talents and medical science. It is by such investigations, excited by the collision of sentiment, that truth ever can be attained. Perhaps no disease of equal mortality has been less understood, or till lately, excited less attention from the medical world. Error has therefore sanctioned error, till the innovator, like Sydenham of old, would now be stigmatized with the crime of heresy.

I am well aware, that to assert and to maintain that the croup is not originally an inflammatory disease, will incur the reprehension of those who have been accustomed to venerate the opinion of ages, and whose practice has always been regulated by that opinion. But happy am I to observe, amidst this mass of prejudice, some coruscations of truth in the most recent publications, from which two thirds of the inflammatory theory has been discarded.

But although I cannot expect a perfect coincidence of opinion with those writers, yet, I trust that others, whose opinions have not obtained equal publicity, will accurately investigate the original and progressive symptoms of this disease; not in the books of visionary theorists, but in the unerring volume of nature—at the bedside of the patient. Such investigations, fully and impartially conducted, must result in the conviction, that this *is not in its commencement, or progress, an inflammatory disease,* but that its *proximate cause* consists in a *torpid state of the absorbents of the trachea,* the modus operandi of which has already been sufficiently explained in the 195th page of the 5th volume of the Medical Museum.

This opinion I shall, therefore, now proceed to corroborate by the following considerations inferred from,

1*st. Its Causes.*

1st. Cold is universally conceded to be one of the most prominent causes of the croup. An elucidation of the im-

mediate operation of this cause, will in some measure explain the nature of the complaint it may induce. It will therefore be necessary to premise a solution to the question, is cold, abstractly considered, sthenic or asthenic?

I trust it will be unnecessary to quote the sentiments of ancient writers upon this subject; their practice clearly indicates their belief in its debilitating operation. Hence Hippocrates and his immediate successors uniformly prescribed cold drinks, and even the affusion of cold water in diseases of increased febrile action. And it was not till the appearance of the alexipharmic physicians, that this practice was discontinued. False reasoning now disclaimed the requisitions of nature, and the poor victim was hurried to the grave by accumulating the morbid heat of the arid system. To eradicate the prejudices originating from this theory, required all the efforts and high reputation of the immortal Sydenham. Amidst a torrent of unprecedented abuse from his contemporaries, he, however, effectually succeeded in restoring the cooling treatment of his great predecessor. This practice has been universally adopted and extended by the moderns; and the success which accompanies its application in diseases of increased febrile action, sufficiently evinces the debilitating operation of cold.

"It cannot be doubted that the power of cold is always more or less directly sedative," are the words of Cullen, whose authority I trust my opponents will not attempt to controvert.

Such also is the opinion of Rush, and of many other writers of celebrity of the present day. Indeed, so universally prevalent is this theory of the operation of cold, that I deem it totally unnecessary to multiply proofs upon this point. I deem it, therefore, perfectly safe to assume the position, that, abstractly considered, in its operation upon the human system, cold is asthenic, and uniformly debilitates, and that the morbid action which it induces is exclusively *asthenic* until

it is succeeded by the application of a higher degree of temperature, or a stimulus of another kind. It is upon the latter principle alone, that cold ever becomes the cause of inflammatory diseases. This subject is susceptible of the clearest illustration, and most convincing proof, a minute detail of which would be entirely superfluous to medical gentlemen, and far exceed the prescribed limits of a dissertation.

If, then, cold directly debilitates, may not its application to the body, or trachea, be so modified as to induce a debility in the absorbents generally, or in those of the trachea in particular, without being succeeded by inflammation? Those who oppose this conclusion will not admit the most obvious phenomena of the human system; they forget that dropsies are thus frequently produced. But if cold alone will produce this effect, how much more certain will be its operation when combined with,

2d. *Moisture.* The debilitating effects of this combination are too obvious to be denied, and are often manifested in the production of intermittents, from which the croup, in its incipient stage, does not essentially vary.

All writers agree, that marshy situations and a humid atmosphere are most favourable for the production of croup. Is it in such situations that we are to look for inflammatory diseases? Are exhalations from marshes necessary to induce that high tone of the system which constitutes inflammatory action? Do we not rather expect in such situations intermittents, croup, and other diseases of debility? The operation of those miasmata produces the spasm of Dr. Cullen; or, in other words, a torpor of the surface of the body. May not the same miasmata, applied under other circumstances, induce a torpor of the absorbents of the trachea, and thus constitute the true symptoms of a well marked croup, without producing the least vestige of inflammation? Will any one undertake to affirm, that this torpid state of the vessels

bears any resemblance to inflammation? As well might they affirm that a similar state of the absorbents, in all cases of dropsy, also indicated inflammation.

No one, I presume, will hesitate to admit, that a torpor of the absorbents of the trachea does sometimes take place. What then are the symptoms which indicate such an affection? Is it possible rationally to conceive of any other than such as do actually occur in croup?

This is also coroborated by the similarity of effect produced by this affection of the absorbents in other cavities of the body. The fluid which accumulates in those cavities, when permitted to evaporate, assumes the same condensed texture as the preternatural membrane formed in the trachea by this disease; this has been verified by repeated and satisfactory experiments.

3d. *Other Diseases.* There is no disease which the croup is found so frequently to accompany, or to succeed, as the *cynanche maligna:* the experience of every practitioner concurs with all writers upon this subject, in establishing the truth of this fact. That the latter is a disease of extreme debility, in which, although a superficial redness and swelling appear in the fauces, bleeding would be extremely hazardous, is also a fact equally confirmed by the concurrent testimony of the highest authorities in medicine; some of which it may not be improper to cite.

Doctor Cullen says "the debility with which the *cynanche maligna* is attended, renders all evacuations by bleeding and purging improper."

Doctor Withering says, "in *cynanche maligna*, the blood is florid and tender, and the nature of the disease is putrid."

Mr. Colden remarks, that "the consequences of evacuation is an insurmountable tendency to mortification, so that the very orifice made by the lancet mortifies."

Doctor Cullen further observes, "that upon dissection it appears that in *cynanche maligna* the larynx and trachea are affected in the same manner as in *cynanche trachealis*," and it is probable, that in consequence of that affection the *cynanche maligna* often proves fatal by such a sudden suffocation as happens in the cynanche trachealis."

It appears then, from the same high authority, that two distinct and opposite diseases contemporaneously exist in the fauces and trachea; one highly inflammatory, and to be cured by bleeding, "ad deliquum animi;" the other of that malignant putrid tendency, in which bleeding is most solemnly proscribed as a fatal remedy. Embarrassing indeed must be the situation of that physician who is called to prescribe in such a case. Would he not be induced to hesitate before he hazarded this herculean remedy; and would not reflection naturally suggest a doubt of the accuracy of the theory already promulged? However plausibly theorists may reason upon the contra-indications of diseases, I never can believe that two diseases of distinct and opposite natures can exist in the system at the same time. However the symptoms may apparently differ, yet nature is one, the disease is ultimately a unit, and the variety in symptoms is resolvable into the same primary cause.

The simultaneous combination of these two diseases, therefore, can be explained only upon the principle that they are both diseases of debility, that both are produced by the same cause, and, consequently, that both require the same general treatment.

That the debility which exists in the fauces in *cynanche maligna* should be communicated to the trachea, and produce a similar affection in the absorbents of that part, ultimately terminating in croup, is an hypothesis, clear and consistent; but that it should ever induce active inflammation, without a radical change in the nature of the complaint,

is absurd, and contrary to uniform experience. We should also naturally conclude upon the principles already advanced, that the facility of this communication, and the consequent liability to tracheal affections, would gradually increase toward the decline of the disease, as debility succeeded to febrile action: this conclusion is verified by facts. All medical writers concur in opinion that croup is more frequently a termination than a concomitant of this disease.

I am aware of the reply that may here be suggested, that croup also sometimes succeeds to small pox, measles, &c.; but as I have never witnessed this occurrence, I think it may fairly be presumed to take place only in that stage of of those diseases when debility has actually commenced. This opinion is confirmed by the testimony of practitioners who have seen this variety of those diseases.

2*d*. *The Symptoms.*

It is with extreme regret and diffidence that I venture to deviate from my medical brethren on a subject so perfectly within the controul of actual observation, as are the symptoms of this complaint; yet such has been my lot, that I have not been fortunate enough to witness those symptoms of inflammation which medical writers generally describe. I have sometimes observed a reaction in the system, accompanied with a degree of heat and fulness of the pulse, but in no instance have I noticed that tension which indicates inflammatory action. The febrile action is generally of short duration when it is succeeded by a weak irregular and tremulous pulse, and by that degree of diminished heat which indicates a high grade of debility. I appeal to every reputable practitioner for the truth of these remarks, and I challenge any one to place his finger upon the pulse in any stage of the disease, and honestly declare his firm conviction of that kind of tension that is a true criterion of inflammation.

If then this evidence does not exist in the pulse, where is it to be found? Is it in that superficial redness and swelling of the fauces, which but rarely occurs, and which all admit, is not necessarily connected with the complaint? All practitioners know that this redness sometimes accompanies a laxity of fibre, and is increased by depletion, as in cynanche maligna.

Is it indicated by a peculiar painful sensation and heat in the trachea, of which the patients sometimes complain?

The most excruciating pains and heat frequently result from the torpor of any particular organ, and are removed by stimulants.

Is it indicated by the coagulable nature of the fluid exuded into the trachea, and which forms the preternatural membrane? This, as has already been observed, in no respect differs from the fluid that is exuded into other cavities of the body in dropsies, and which experiments have converted into a membrane of similar density.

Is it indicated by that preternatural heat of the skin which sometimes occurs in the incipient stage?

This is never so great as the heat which always accompanies the paroxysm of an intermittent, or the latter stages of a typhus gravior.

Is it indicated by the termination of the disease? Doctor Cullen says, "although this disease manifestly consists in an inflammatory affection, it does not commonly end either in suppuration or gangrene." As inflammatory diseases, which prove mortal, generally assume one of these terminations, an inquiry naturally arises, why this highly inflammatory disease, so essentially deviates from others of the same class.

Doctor Cullen's answer, which ascribes this failure to a spasm of the muscles of the glottis, is, to my mind, totally

unsatisfactory, and involves him in a difficulty unusually embarrassing.

If any practitioner will adduce an instance in which a *simple* case of the croup has had either of these terminations, I will totally abandon the ground I have taken. I would not however be understood to deny that the trachea is ever affected by any degree of inflammation in this disease; such an affection does sometimes occur in a slight degree, whether it originates from the efforts of nature to remove the disease, or from the irritation produced by the friction of the condensed membrane in the struggles to respire, or from any other incidental cause, it is impossible to ascertain, and totally immaterial. I only contend that it is not necessarily connected with the disease; which is proved by its being frequently found to exist without any such affection.

On a careful review of the individual and collective symptoms, as they appear in the commencement, progress, and termination of this disease, I have been disappointed in searching for satisfactory evidence of inflammation; I have therefore had recourse to

3d. Dissections.

I have with much care, minutely examined the trachea of four infants who died of croup, in three of which, not the least trace of inflammation could be discovered; the fourth exhibited some evidence of such an affection, but was not so clearly designated as to place it beyond dispute.

The inference deduced from these cases is, that as three afforded no evidence of inflammation, the fourth was affected by some incidental cause not necessarily connected with the complaint: this conclusion is corroborated by similar observations made by other dissectors.

Doctor Richard Bayley, of New-York, who was a strong advocate for the inflammatory theory, relates three cases of dissection which exhibited no marks of inflammation; on one of which he thus expresses himself. "At the dissection several gentlemen of the faculty were present, and we were equally surprised when it was discovered that the parts beneath the new formed membrane were entirely free from disease."

Doctor Home also relates several cases of dissections which did not discover the least vestige of inflammation. Similar discoveries have been frequently made by other dissectors, but enough has already been cited to establish the position that the croup does sometimes exist without any symptoms of inflammation. How are we to explain the phenomena of the disease in such cases? Are not the symptoms precisely similar to those cases which are denominated inflammatory, and were they not so considered till disproved by actual demonstration? Is it a satisfactory solution to this difficulty, to assert that the croup is sometimes inflammatory and sometimes not? Those acquainted with diseases know that when an inflammatory disease loses its phlogistic diathesis, its nature is completely changed; pneumonia would, in that case, cease to be characterized by that name. The absurdity therefore of this mode of solving the difficulty is too apparent to require a formal refutation.

4th. Treatment.

On this subject a variety of opinions divides practitioners. Some recommend bleeding "ad deliquum animi" as indispensably necessary; others are equally sanguine in the belief that it is always injurious: although so totally distinct in practice, these different classes unite in advocating the same phlogistic theory, many of whom are considered high authorities in medicine. But is not actual demonstration preferable to

the highest authority that can be adduced? Error can never be converted into truth by the weight of names: error at its inception continues error in its progress. The demonstration of a Harvey dispelled the mists of error which had been sanctioned by ages. Yet the prejudices of his cotemporaries prevented the acknowledgment of that conviction, which his correct views of the circulation must have produced. Such, also, was the success of a Hoffman and a Cullen, in exposing the errors of the humoral pathology, that the vascular has been universally received in opposition to the laboured disquisitions of the greatest talents, aided by the strongest prejudices of antiquity.

Fortified by these examples, and with a full conviction of the truth of the theory I have advanced, I have ventured to dissent from the highest authority of the republic of medicine. But I trust the facts which I have adduced, with the preceding remarks, afford some plausible ground for the course I have taken, which will acquire additional strength from the success of a different mode of treatment.

Bleeding copiously in this disease has long been the universal practice, and long have we had to deplore the fatality of the croup: but I trust the period has arrived, when a more consistent theory will conduct the treatment to a more successful issue; when depletion by the lancet will, in most cases, be considered a hazardous experiment.

To show that I am not alone in this opinion, it may not be improper to cite a few authorities upon the propriety of this remedy. Speaking of croup, Doctor Hartly says, "I have tried evacuations of all kinds, and frequent bleedings were of no service."

"It is difficult to discover," says Dr. Crawford, "in what cases Dr. Millar judged venesection proper."

Doctor Rush was of a similar opinion in his original publication upon this subject.

Doctor Smith found bleeding highly injurious, and of a list of eighteen cases which he has published, seven were bled, five of which died, and two only recovered, while the remaining eleven who were not bled, all recovered. Although these authorities have no claim to antiquity for a sanction to their opinions, I trust the fidelity of their observations will not, therefore, be the less credited. It is with much pleasure that I am, from my own experience, enabled to bear testimony to their truth; while I cannot forbear expressions of regret for the ill success that attended the free use of the lancet in the early part of my practice. Embarrassed by the fatality of a disease which baffled the remedies usually prescribed, I was induced to reflect with more attention upon the nature of the prominent symptoms, by which I was determined to be exclusively influenced. Names are always deceptive, and often lead to the use of remedies sometimes improper for the disease. Not being able to discover any symptom that indicated the necessity of depletion, I was resolved to suspend the use of the lancet till such indication should appear. The event completely justified my determination, from which I have never since found it necessary to deviate.

I will not however affirm that bleeding is, in all cases, improper: some may occur in which the use of the lancet will be indicated. I can only say that such have not occured to my notice.

My principal object, in the selection of remedies, has been to excite the action of the lymphatic system, but particularly the absorbents of the trachea, by a sudden and powerful operation. A combination of calomel and antimony, in large doses, generally succeeds in producing this effect. At the same time that one operates upon the stomach, the other commences its operation upon the intestines, and the whole alimentary canal becomes thus simulta-

neously affected; the torpid lymphatics are thence roused into action, and the loose cough which immediately succeeds, evince, that the absorbents of the trachea are re-assuming their office. Till these effects are produced, I repeat the dose every eight hours, using, in the intervals, those stimulating auxiliaries generally prescribed, such as seneka, warm bath, epispastics to the trachea, inhalations of the steam of vinegar, ether, &c.; remedies better calculated to remove a torpor of the absorbents, than to obviate all phlogistic diathesis. Doctor Archer says, the seneka, and assa fœtida, operate in this disease by their stimulating qualities alone.

In their ardor to support the phlogistic theory, its advocates should not forget the stimulating operation of the remedies which they invariably prescribe.

The preparation of antimony, which I have generally combined with the calomel, is the stibium antimonii, but as its operation is sometimes too slow and uncertain, I have occasionally substituted the tartrite of antimony with equal success.

Those who have not been minutely attentive to the diagnostic symptoms of croup, and particularly to the extreme torpor of the stomach, are alarmed at the doses which I prescribe; judging, as they do, of the powerful operation of these medicines in other diseases, they transfer their effects to the croup, and indiscriminately condemn the practice. A little experience and careful investigation will remove this error. The more clearly to elucidate it, I shall subjoin a case in which the torpor of the stomach baffled the operation of the most powerful doses that I ever prescribed.

In December, 1810, at 9 o'clock, A. M. I was called to visit the child of G. S. aged 4 years. It had been affected with the usual symptoms of croup two hours previous to my visit, and was rapidly growing worse; I immediately gave

it fifteen grains of calomel, and eight grains of stibium antimonii; in two and a half hours I called again, and was surprised to find it had produced no sensible effect: I then gave twenty grains of calomel, and ten grains of stibium antimonii, and directed seneka, warm bath, epispastics, and the inhalations of the steam of vinegar: two hours afterwards the medicine had produced no operation, and the disease was fast increasing: I then gave twenty grains of calomel, six grains of the tartrite of antimony, and directed three grains of the latter to be given every half hour. The directions were faithfully pursued, without producing the least cathartic, emetic, or even nauseating effect. The child expired at 8 o'clock, P. M. of the same day, eleven hours from the time I first saw it, and thirteen from its first attack.

In this case, fifty-five grains of calomel, eighteen grains of the cerated antimony, and eighteen grains of the tartrite of antimony, were given in the short space of eleven hours.

This is an extreme case, and exhibits an astonishing instance of the torpor of the stomach, and the necessity of an early administration of the most powerful remedies. But in ordinary cases, in an advanced stage of the complaint, twenty grains of calomel, and eight grains of cerated antimony combined, will produce but two or three operations as an emetic, and as many by stool. Where then is the danger from this powerful remedy? It exists only in the prejudiced mind.

Every case of the croup, unconnected with any other disease, in which these remedies have operated, has afforded the most complete evidence of their success. No other treatment has been equally satisfactory to me, and I presume, not to others, where both have been fairly tried.

II.

An Inquiry *into the* Action of Cold *upon the* Animal Body. *By a Friend to Improvement.*

Of the various questions which have at different times engaged the attention of medical characters, none, perhaps, has led to more ardent discussion than that of cold, both as respects its nature and its operation. Its well known power in the production, as well as in the removal, of some diseases, discloses an object of sufficient importance to account for the particular attention it has received from the practitioner of medicine; and its connexion with the more general phenomena of the universe, as exhibited in the scenes of winter, has drawn on it the labours of the student, and admirer of nature. Thomson, in his celebrated poem on the *Seasons*, has described the obscurity and intricacy of the subject, in the following elegant manner:

> "What art thou, Frost? And whence are thy keen stores
> Deriv'd, thou secret, all-invading power!
> Whom e'en th' illusive fluid cannot fly?
> Is not thy potent energy, unseen,
> Myriads of little salts, or hook'd, or shap'd
> Like double wedges, and diffus'd immense
> Thro' water, earth, and ether?"

We find, on examining the records of medicine, that professor Mushenbroek many years ago attempted to establish a plausible theory of the nature and operation of cold, on the mechanical doctrine which prevailed in his time. According to him, cold was a peculiar agent, distinct from heat and all others, consisting of frigorific particles. It was supposed, that by the introduction of these atoms, or particles, into our organs, the sensation of cold was produced. When a piece of ice, or a lump of cold iron was laid on the warm

hand, the particles of frigorific matter were imagined to be precipitated into the hand, and the sensation of cold which ensues, was, by him, imputed to the mechanical impulse made on the sensible fibres. Shortly after this singular piece of speculation was ushered into the world, chemistry experienced great and unlooked for improvements. The laws of heat, and many of its phenomena, largely partook of the true light reflected from the talents and labours of a few great chemists. Among these, the name of Black is pre-eminently conspicuous, and the votaries of science should long hold the recollection of his useful and splendid labours in the most grateful remembrance. It is to his inimitable researches into the laws and effects of heat, to his just explanations of the evidently mistaken observations and experiments of professor Mushenbroek, the world has been chiefly indebted for the complete refutation of the doctrine of the positive and distinct nature of cold. As the effects of every agent on the living body, as well as its mode of action, depend in some degree on their nature, it becomes necessary to have a perfect understanding on this head, as respects cold. The term has been used by some writers to express indefinitely, either a condition of surrounding bodies, to produce in our organs the sensation of cold, or to convey a meaning of the sensation itself. This indeterminate sense of the word is objectionable. First, because it imposes the expression of, or rather identifies as the same, two different ideas, viz. the cold agent, and the sensation; and secondly, because it is too vague for precise inquiry. The facts and experiments which prove the terms, heat and cold, to be of a relative import, only implying the same fluid in different degrees, are at the present time so generally known and admitted, that an enumeration of them would be useless, it being only necessary for the purposes of this inquiry, to avow my perfect adoption of it. *Cold*, then, I beg leave to consider an ab-

straction, or an inferior degree of heat, and neither an indefinite condition of surrounding bodies to produce the feeling of cold, nor the sensation which succeeds its application to our organs. But for the sake of a further understanding, it may be necessary to advert for a moment, to what will constitute this lesser degree of heat. By it, I mean simply to express that condition of bodies in contact with our organs, which arises out of their temperature being inferior to that possessed by the living matter at the time of their application. For example, whenever an article is applied to any part of our body whose heat is below that of the living substance, no matter whether the animal heat be either above or below its natural standard, it forms what is called a cold agent, which is a lesser degree of heat. Water of the same temperature may feel both hot and cold to the same hand by varying the heat of the latter, which proves that the faculty of producing a feeling of cold, is not dependant on *any specific low degree of heat*, but wholly on the temperature of the agent *being lesser than that of the organ affected.*

Having made these preliminary remarks, I shall pass on to a consideration of the effects of cold, and its mode of action. At different times, various have been the opinions and the speculations of physicians on this subject. By some, it has been believed that cold has many modes of operation; by others, that it is solely a stimulant; and by many, it is contended that it is exclusively a sedative or a debilitating agent. Dr. Cullen asserts, that cold is not only stimulant and sedative, but that it is also possessed of considerable tonic and astringent powers. His words are, "beside the sedative and stimulant powers of cold, it is manifestly, also, a powerful astringent, causing a contraction of the vessels of the surface, thereby producing a paleness of the skin, and a suppression of perspiration; and it seems to have similar effects when applied to other parts. It is likewise probable,

(continues the doctor) that this constriction, as it takes place especially in consequence of the sensibility of the parts to which the cold is applied, will in some measure be communicated to other parts of the body, and that thereby the application of cold proves a tonic power with respect to the whole system." If the paleness of the skin and suppression of perspiration, which occur on an exposure to a cold atmosphere, were the effects of increased vascular action on the external surface, then the heart and large arteries would also have their motion invigorated, as the cold air would have an equal opportunity to rouse their activity through the thin texture of the pulmonary surface, as it would have of stimulating the capillaries through the cuticle. So far, however, is this from being the case, that numerous experiments have proved that the action of the heart and arteries becomes languid, and the pulse less frequent, while the body is exposed to a cold atmosphere. Reasoning on the uniform disposition of cold to diminish the excitement by depriving the system of a portion of its heat, and the authority of experiment, induce me to doubt the force of the doctor's conclusions, and to impute the paleness of the skin, together with a suppression of the perspiration, to a general subsidence of excitement, but more especially in the cutaneous circulation.

This explanation, I trust, will seem the most probable, as it is natural to suppose that the first effects of an inability, in the heart and arteries, to force the blood through the fine vessels of the external surface, would be a paleness of the skin, and a suppression of the perspiration. His assertion of cold being not only *stimulant*, but likewise *sedative*, seem more obviously incorrect, it being difficult to conceive how the same cause should be able to produce directly opposite effects. He defines sedatives to be certain articles, whose operation *diminishes* both the sensibility and irritability of the system, and thereby *the motions*, and the power of motion.

Stimuli, so far from *directly destroying action*, he supposes to be "powers *exciting the action of moving fibres.*" A late advocate of the stimulating operation of cold, deduces from Dr. Cullen's definition of stimuli, the following curious argument in support of his doctrine: "This definition," he says, "has never been exploded, and yet cold is found to excite both motion and sensation." He asks the question, "is the definition erroneous, or is cold a stimulus?"

Strange infatuation! The ingenuity of some theorists in supporting their doctrines is worthy of remark; but in justice to truth and more honourable inquiry, their art must not be permitted to pass by unexposed. Mark the construction of this quoted argument: "Dr. Cullen considers stimuli as powers exciting the action of the living principle, whether causing sensation, or producing the action of the moving fibres." "This definition," he says, "has never been exploded, and yet cold is found to excite both motion and sensation. Is the definition erroneous, or is cold a stimulus?" The sentence is so worded as to draw the attention of the incautious reader from what I conceive to be a most erroneous assertion of cold, being able "to excite both motion and sensation," by pointedly intruding upon him the reverend Professor's definition, and then the more general question of what the modus operandi of cold is; thinking thereby, perhaps, to force the reader into an acquiescence of opinion, and at the same time to conceal from his notice the assertion, which is as unfounded in truth as the whole doctrine it was intended to support. If mere assertion is to be taken for matter of fact, it would be wondrous easy to establish the stimulating operation of cold, or any other piece of speculation. The same writer says, "one of the first effects of cold is paleness of the skin and cutis anserina. In the scrotum a remarkable contraction is produced. There is 'action of the moving fibre,' propagated like other impressions, by sympathy. The same

effects result from certain sounds, as that which is heard in filing the teeth of a saw. Ideas of the mind often excite cutis anserina."

Certain sounds and ideas may produce these effects by a stimulant mode of action, but this will no more prove cold a stimulus, than sleep, being produced by darkness, proves it to be stimulating, because opium does the same thing. In defending this stimulant theory, its advocates appear entirely to disregard the nature of cold, or its connection with heat, reasoning on its operation, as if it were some separate cause of motion, and seem to avoid a discrimination of the changes it induces in the living body, from the effects of certain other agents avowedly stimulating. That such has been their policy, is openly declared by the writer whose remarks have just been quoted. His own words are "when two causes produce precisely the same effect, is it not perfectly just to conclude that both act in the same way, and therefore, that both are stimulants, or both sedatives." If such a rule, of inferring identity of causes from similarity of effects, should be granted, I would at once confess it would require no great labour or ingenuity to prove cold a stimulus. As respects the living body, I believe no rule would lead to more confusion and false inquiry, than this. Fox-glove, and blood-letting induce precisely the same state of the pulse, and every one must know how ridiculous it would be "to conclude that both act in the same way, and therefore, that both are stimulants, or both sedatives.". Indeed, so far does this proposition seem to be allied to truth, that it is not uncommon to perceive opposite causes resulting in effects very similar, and that too, by modes of action evidently different. The similarity, and perhaps the identity of the effects, arising out of the two debilities of action and abstraction, is illustrative of the remark; and the striking difference between the causes inducing those states of the body, stimuli

and debilitating agents, as well in their modes of action, should be regarded as quite sufficient to expose the futility of inferring identity of causes from similarity of effects.

Resuming the further consideration of the argument, it may be said that medical knowledge, at the present time, is too imperfect to admit of such an explanation of the action of either *harsh words*, or *ideas of the mind*, as would be approved of by the cautious reader. I will, however, venture to predict, that whenever their action is clearly ascertained, it will prove as foreign to that of cold, as the operation of the latter is unlike that of a stimulus. I beg leave to adopt the more general, as well as the more plausible opinion, that paleness of the skin and cutis anserina, from cold, are the effects of an evidently debilitating, and not a stimulating operation. I must again allude to what has been previously stated. Cold, by which is meant nothing more than a lesser degree of heat, induces torpor in the extreme vessels, and the cutaneous circulation becomes diminished. There would of course be less blood pushed through the collapsed capillaries, thereby giving rise to a paleness of the skin; and cutis anserina would also be formed by the same shrivelling of the superficial parts, having the subcutaneous miliary glands in a visible state. And as relates to the "remarkable contraction" of the scrotum, it is well known to the anatomist, that elastic cellular membrane composes no inconsiderable part of that organ, and by abstracting a portion of the flaccid and relaxing influence of heat, cold would very readily throw this general appendage into a rugose condition. In this case, however, there is no more vital contraction from stimulus and excitability, than there is in the well known bracing or contraction of a pouch of gum elastic, from an exposure to a degree of cold. The effect, it is conceived, must be entirely imputed to the condensing or corrugating operation of a low temperature on

the universally acknowledged elasticity of cellular substance.

The application of Dr. Cullen's theory of the stimulant and sedative powers of cold to the practice of medicine, will, if I mistake not, disclose some inconsistencies. In the treatment of diseases consisting of excessive action in the arterial system, the first indication of cure, according to his practice, is to moderate the violence of reaction, and this, the doctor says, may, in conjunction with other means, be accomplished by the application of air, of a low temperature, to the body. "Some late experiments," says this respectable writer, "in the small pox, and in continued fevers, show that the free admission of cool air to the body, is a powerful remedy in moderating the violence of reaction." The experiments alluded to were certainly correct, and have since been confirmed by the most ample experience; but if it were as evident as he has supposed, that "cold is a stimulus to the living body, and *particularly to the sanguiferous system*," why, to the entire disregard of this sentiment, advise so stimulating, and, as one would imagine, so obnoxious a remedy in inflammatory diseases; and that too, as he tells us, to moderate the violence of reaction? The doctor's second indication of cure in continued fevers, is to remove the cause, and obviate the effects of debility, which he proposes to accomplish by the use of stimulant and tonic remedies. Notwithstanding experiments were quoted to show that cold is a powerful remedy in moderating the violence of reaction, we find it placed by him at the head of his class of tonics, and strongly recommended to support and increase the action of the heart and arteries.

It appears from the concurrent observation of different writers, that when the animal body is surrounded by an atmosphere of about sixty-two or sixty-three degrees of heat, by Fahrenheit, it retains its own standard temperature, and

that neither durable sensations of heat nor cold can be produced, unless the temperature of agents applied is either considerably above, or below the degrees mentioned.

If the body were suddenly exposed to a very low temperature, the first change which would occur, would be a loss of several degrees of its heat, and I conceive, according to the extent of the loss of this active stimulus, would the excitement subside. That such a decrease of action does really ensue, no further proof, one would suppose, could be required, than the knowledge of the fact of the system having been deprived of a portion of stimulus; and of course, *the sum of excitement must be diminished.* Such a view of the subject admits no room for the supposition of a stimulant power. Had the opinion of Mushenbroek been confirmed, or could it be made to appear, that cold possesses some absolute and separate property from its inherent disposition to draw heat out of the living body when in contact with it, then there would have been some foundation for the hypothesis of its stimulant action. The appearances the body takes on when exposed to cold, some of which have previously been noticed, clearly evidence what its real operation is. The paleness of the skin, the cessation of perspiration, the slow and weak pulse, which have been observed to take place, are expressive marks of diminished excitement. First, because the same effects are known to occur when the body is in a state of debility from other causes; and secondly, they are proved to be the effects of lessened, and not increased excitement, by their being quickly succeeded by an evident accumulation of the excitability.

Hence the blush of the face after an exposure to a blast of cold air, and hence the glowing warmth of the whole frame after emerging from the cold bath.

The stimulant theory seems to fall short of a satisfactory explanation of the effects of a moderate degree of cold: let

us, in the next place, see how it will embrace the facts connected with the operation of a great degree of it. If cold produce its effects by a stimulant mode of action in the case of a frosted limb, the excitement of the part must be primarily augmented, and by a continuance of the operation of the cold, the capacity to excitement would become expended to such a degree as to ultimately prove incompetent to the longer continuance of vital motion. Then the limb becomes frozen; and respecting the indication of cure, this must be determined by the kind of torpor which constitutes the affection. If it be produced by a stimulating power, then the state of a frozen limb must be that of high, indirect debility. Now, in the cure of indirect debility, we are told that active stimuli can only be relied on; therefore, by this doctrine of the stimulating action of cold, we should be induced to apply to a frozen limb, stimulants of the most vigorous description. The consequences of such practice would be as fatal to the patient, as the theory from which it has been inferred, is, in my opinion, foreign to the truth. The extreme liability of a frosted limb to become inflamed, under the influence of no more than ordinary stimulus, shows the affection under consideration, consists of direct, and not indirect, debility. This pathological construction, founded on the debilitating operation of cold, it is well known, as invariably conduces to a successful medical treatment, as that derived from the other theory would end in gangrene and mortification.

The experiments of the late Mr. Hunter* are sometimes referred to, as affording superior evidence of a stimulating power in cold. Had I not seen them quoted under such an apparently high sense of their weight and importance on this question, I should not have felt it necessary to notice

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* Animal Economy.

them. I beg to be understood not to intend any reflection, either on them or their immortal author, wishing only to assert that these experiments seem not much to affect the present question. They were made by pushing a thermometer through incisions made into the abdomen of various animals, immediately before and after an exposure of them to a refrigorated atmosphere. By comparing the warmth of their viscera at those different periods, Mr. Hunter endeavoured to ascertain the faculty of the animal œconomy, to produce and retain sensible caloric. Some zealous supporters for the stimulant theory, without making any deduction for that increase of animal heat which must unavoidably arise out of the wounds inflicted, and the irritation produced by thrusting the thermometer among the sensible viscera, have contended that the change of temperature observed by Mr. Hunter, was occasioned by an exciting power of cold.

The late Dr. Currie, of Liverpool, distinguished no less for literary knowledge than medical eminence, in his very useful work on the effects of the warm and cold bath, has advocated the stimulating action of cold. The beneficial effects observed to follow the affusion of cold water in the torpor of convulsion, and in the apoplectic state of fever from the fumes of charcoal, are particularly urged in support of his opinion. It is however well known, that remedies of different modes of action have produced effects equally salutary in different states of the same disease; I cannot therefore discover any particular force in the doctor's argument. If the rule were admissible, to denominate every remedy a stimulus which produces beneficial effects in tetanus and apoplexy from the fumes of charcoal, then bloodletting would seem somewhat stimulating, as it has often been useful in both of those diseases. If it could be established that tetanus and apoplexy were, necessarily, dis-

cases of such a debilitated state of the body, as would make the stimulating method of cure necessary, then I think Dr. Currie's argument would better apply. This, however, cannot be done. To fluctuate from one state to another is the very nature of diseases of all kinds, and that physician who will attempt to restrain either tetanus or apoplexy, within the narrow limits of a uniform character, must aim at an object far beyond the reach of his talents. It is true, that a stimulating mode of cure, in general, is found necessary in tetanus, but it must be equally well known, that in some cases, an opposite plan only would answer. Dr. Moseley says, the Spanish surgeons in the colony rely on bleeding and emetics; and the very respectable Dr. Percival advises bleeding, cupping, blistering, &c., as the remedies which have proved, in his hands, the most useful in the removal of apoplexy occasioned by the fumes of charcoal. The analogy which is generally believed to exist between the operation of cold and darkness, has been objected to by Dr. Currie. On this point he discovers ingenuity, but on account of many reasons, I am most decidedly of the opinion their effects are highly similar. Cold produces evident inactivity in the superficial vessels, and thereby occasions a suspension of the functions of the skin: darkness causes evident inactivity of the retina, and thereby suspends vision. Cold accumulates the excitability of the system to the action of stimuli: darkness accumulates the susceptibility of the retina to the stimulus of light. But these analogies, though they go to prove the operation of cold to be like that of darkness, directly sedative, or debilitating, do not directly refer to his particular objection to the comparison. He says their operation must be dissimilar, because cold produces sensation, while darkness does not. Had he substantiated this assertion, by either plain facts or reasoning, it would be granted that the parallel was deficient, and it

would also be confessed, if it had been proved cold can excite sensation, that at least one strong argument might be urged in favour of its stimulant operation. But I will attempt to show that the objection has no other ground to rest on but mere assertion, and is one of the many common opinions, too often met with and adopted by writers, without either timely reflection or examination. It is contended, that the primary influence of cold on the body, is the abstraction of several degrees of the stimulus of heat; consequently, the original quantum of vital action which the standard heat of the system had excited and maintained, must now lessen in the ratio of the loss of stimulus. The primary effect of cold, being an abstraction of heat, it follows, that the sensation of cold cannot occur until this effect of cold had taken place; then the sensation ensues, and this period of its occurrence is immediately subsequent to the diminution of excitement occasioned by the loss of heat, which must necessarily depend on the reduced excitement still retained by the organ to which the cold agent had been applied. That the sensation of cold does not arise out of a direct stimulus applied, "exciting the action of the moving fibres," but is really connected with, or dependent on the lessened excitement of the part, can be made very plain. If the sensation and the pain of cold were the consequence of an increase of action in a part, should not that part, agreeably to all the established laws of excitement, become less excitable to stimuli than previously? It certainly should; but we find cold is so far from consuming excitability, which it should do if it were a stimulus, that it actually leaves a part in the possession of more of this principle than it at first had. When the hand is thrust into a snow bank, or into iced water, though the pain and the sensation of cold are felt to a considerable degree, yet in a very short time after withdrawing it, both an increase of warmth and action take place. Hence

the face becomes of a red colour in a cold day on turning from the wind, and hence the redness of our hands when warmed by the fire. If, in those opposite conditions of the system, direct debility, and an inflammatory state, the effects of cold be contrasted with those of acknowledged stimuli, such as opium and ardent spirits, other proofs of its sedative action will be furnished. These stimuli, by creating excitement, remove weakness in the one, and aggravate the morbid affection in the other. Can cold, in the same states of the system, produce similar effects? Let us see what its effects are in the cold stage of fever; a state of debility in which it should prove beneficial if it be *tonic*, *astringent*, and *stimulating*. "While the patient," says Dr. Currie, "was still in the cold stage of the paroxysm, the assistants removed him from his bed, his pulse was small and frequent, his extremities shrunk and cold; in this state the brine* was dashed over him as usual, but not with the usual happy effects, his breathing was for some minutes almost suspended, his pulse at the wrist was not to be felt, the pulsations of the heart were feeble and fluttering, a deadly coldness spread over the surface, and when respiration returned, it was short, irregular and laborious."

This looks very unlike the operation of either tonic or stimulus.

Irritants, or stimuli, are, for reasons the most obvious, avoided in inflammatory complaints; if cold be a stimulus, it must be injurious also. Let us see how it is. "Some late experiments," says Dr. Cullen, "in the small pox, and in continued fevers, show that the free admission of cool air to the body, is a powerful remedy in moderating the violence of reaction." Then cold must be sedative, or we must sup-

* A bucket of cold water, made additionally so by dissolving in it common salt.

pose that the heart and arteries can have the violence of their reaction in the fever of small pox, &c. *stimulated into moderation.*

If cold be stimulating, the common custom of associating its use with the lancet, in diseases of great morbid action, must be inconsistent in theory, and injurious in practice. Let us again ask the oracle, experience, whether physicians at all times, and in all countries, have thus grossly erred. In the yellow fever, which nearly depopulated the city of Philadelphia, by its ravages in the year 1793, our not less great, than worthy Dr. Rush, used cold water in connection with the lancet, with the most decided advantage. "Cold water," says the professor of the institutes, "was a most agreeable and powerful remedy in this disease. I directed it to be applied, by means of napkins, to the head, and to be injected into the bowels by way of clyster. It gave the same ease to both, when in pain, that opium gives in pain from other causes. I likewise advised the washing of the face, and hands, and sometimes the feet, with cold water, and always with advantage."

The examination of the effects of cold has not been confined altogether to speculative research, but has been very closely, and I may add, very ably investigated in an experimental way. Without attempting a detail of what has been done, it may be proper to state that the principal experiments which have been made, are those of Dr. Currie, before quoted; Dr. Stock, of Great Britain; and of Dr. Joseph Klapp, of this city. Those of the last gentleman are pretty numerous, and seem to have been modified in such a way as to meet the principal difficulties of the subject. As a very proper conclusion to this essay, I must beg permission to transcribe them, his mode of proceeding, and the result of his experiments so perfectly corresponding with my own sentiments. Dr. Klapp introduces the subject with an ap-

propriate passage from Darwin, and then makes a few observations on the advantages of his mode of experimenting.

"Some modern writers have called cold a stimulus to animal fibres, which it always renders torpid or inactive; a theory derived from Galen, and which must have originated in his total ignorance of chemistry and natural philosophy." "When the philosophic inquiries of the chemist into the nature of cold, were contrasted with the speculations of the physician, concerning its modus operandi, it was remarked that the former had long since approximated truth by the guide of experiment, while the latter was still involved in controversy and doubt, in consequence of its having been in the most of instances left to the disposal of hypothesis and the most pliant facts."* To this observation, however, the late Dr. Currie, of Liverpool; and Dr. Stock, of Bristol, must now be noticed as exceptions.

They respectively instituted a series of experiments, the results of which favour opposite opinions. Dr. Currie was a warm advocate for the stimulating operation of cold; while Dr. Stock, with equal zeal, and, in my estimation, with more success, has endeavoured to establish a contrary theory. But their mode of experimenting does not appear to be altogether free from objection; at any rate, it certainly cannot be considered the most decisive method of prosecuting this highly important inquiry. The persons who were the subjects of their experiments were nearly, or quite immersed, and in some instances, plunged suddenly into cold water, and the state of their pulse was afterwards taken, as an indication of the change of excitement which the cold produced in their systems. It appears to me, that this method of experimenting unavoidably incurs such a degree of impression

* Alluding to his Anniversary Oration before the Philadelphia Medical Society.

on the system, from other causes, as to make it a matter of extreme difficulty to decide with certainty on the true and separate effects which ought to be attributed to the cold. For example, the sudden change of medium, from that of atmospheric air, to water, must operate in some degree on the system, with the force of a mechanical agent. And one would naturally suppose that those muscular exertions which were incurred in excessive shivering, and in swimming backwards and forwards, would infuse into the system, with cold, such blended effects, as to make it a question what ought to be imputed to collateral agents, and what was really produced by a mere change of temperature. With the expectation of being able to avoid all, or the most of these difficulties, I have instituted a few decisive experiments, which, with a few exceptions, were performed in a medium of air, instead of water. In this way the living system was only liable to a variation of its excitement from a change of temperature, as unusual muscular exertions were prevented by the subjects of the experiments, walking composed out of one room into another. It is true, that even in this most precautionary way, some tremor, or shivering did occur, but not to such an extent, it is conceived, as would affect the result of the experiments.

Experiment 1*st*. On due examination, my pulse was ascertained to afford seventy-four pulsations per minute, and as to quickness and fulness, it was as usual. My feet and legs were then immersed in a bucket of cold water, a few degrees above the freezing point. The gentleman who gave me assistance was very cautious and particular in noticing every change which occurred in the pulse, and the following is an exact account of his report: two minutes after the immersion, the pulse beat sixty-three strokes the minute; three minutes, sixty-two; four minutes, sixty-two; six minutes, sixty-four; and seven minutes from the commencement of

the immersion, it afforded sixty-nine pulsations per minute. As the water was now acquiring warmth, the experiment was discontinued. The pulse was observed not only to become less frequent, but it lost much of its force and fulness.

As the design of the experiment related, appeared well calculated to produce decision in the present controversy, I was induced to repeat it after Dr. Rush, and its result with me confirms the doctor's statement.

Experiment 2d. My feet and legs were immersed in a tub of recent snow, which had fallen during an exceeding cold night of the month of January. On placing the ball of Farenheit's thermometer in the snow, the mercury immediately descended to the freezing point. In two minutes after the beginning of the immersion, the pulse became very weak and full, in frequency, from seventy-four pulsations, to fifty-eight, in a minute. This experiment was repeated the same evening, on a healthy young man, with the same result. In both instances, after the immersion had been discontinued for the compass of a few minutes, the pulse resumed something more than its usual force and frequency.

To those inferences which these experiments obviously afford, it may be replied, "even admitting it as a fact, that cold does always diminish arterial action, it does not follow from thence, that it is in its nature, necessarily, and essentially a sedative, or a debilitating agent; because digitalis and saccharum saturni, when taken internally, reduce both the force and frequency of the pulse; so, also, does tartar emetic; yet neither of these articles can be considered as a sedative. They are all powerful stimulants to the stomach, and reduce arterial action only by sympathy." Instead of the conclusion of the sedative operation of cold from the fact of its directly reducing the force and frequency of the pulse, "bespeaking a partial view of things," I am most decidedly of the opinion, that this method of reasoning

is perfectly consonant with every established and rational rule of judging of the modus operandi of medicines. To assert that saccharum saturni, digitalis, and tartar emetic, reduce arterial action in the same way as cold, exposes a singular disregard to all experiment and observation. Dr. Moore, who graduated in this university some years ago, has related, in his inaugural thesis, a number of experiments, which indisputably prove that the primary effect of digitalis on the system, is an acceleration of the pulse; and from my own observation on different persons, while under the primary impression of large doses of saccharum saturni, and last, an emetic, I can with confidence declare, that they both first elevate the pulse for a few strokes, before they diminish it in frequency. My experiments on these two articles will perhaps, ere long, be handed to the public.

If cold be a stimulus, then its general application to the animal body, comprising not only the cutaneous, but the pulmonary surface, must augment muscular strength and arterial action. With the view of investigating this point, the following experiments were instituted, with such a regard to fairness and impartiality, as to induce me to challenge such as may doubt to repeat them.

Experiment 3*d*. The gentleman who was the subject of the last experiment, when repeated, exposed himself nearly naked, to an atmosphere which sunk the mercury, in the thermometer of Fahrenheit, to the freezing point. On examining his pulse, one quarter of an hour after the commencement of the experiment, it had lost much of its force and fulness, and was diminished in frequency, from seventy-six, to sixty pulsations in the minute.

In reply to the various proofs which have from many quarters been obtained, of the power of a high degree of cold to diminish the force and frequency of the pulse, it has been asserted that such evidence is not conclusive, since the fact

" is only true with regard to very high degrees of cold, and a moderate degree of it invigorates the blood vessels, muscles, and every other part of the system." This opinion is openly exposed and refuted by the succeeding experiments.

Experiment 4th. After different examinations were made by a medical assistant, my pulse was found to beat, in the radial artery, sixty-eight times in a minute, and was usual, as to force and fulness. I now walked into another room with no clothes on excepting my shirt, and after being exposed to its air, of the temperature of forty degrees of Fahrenheit, for twelve minutes, the pulse afforded fifty-eight feeble strokes in a minute; in fourteen minutes it was at fifty-six; in fifteen, fifty-six; in sixteen, fifty-four; and in seventeen minutes from the beginning of the experiment, the pulse emitted fifty-six weak strokes in the minute.

Comparative with the degrees of cold, which were used in the former experiments, that of the last one may be termed moderate; but notwithstanding this variation of temperature, it does not appear that the effects produced on the pulse, are in any respect different, except in degree.

The following, however, may be deemed more to the point, and therefore more satisfactory.

Experiment 5th. J. E.'s pulse, after due examination, was found to beat seventy regular, and usually, full strokes, per minute. He then walked into another room, with no clothes on excepting a loose shirt; and on the sixteenth minute of his exposure to an atmosphere of the temperature of fifty degrees of Fahrenheit, his pulse beat sixty strokes; on the eighteenth, fifty-eight; and on the nineteenth minute, it afforded fifty-nine pulsations; from the commencement to the end of the experiment, the pulse was sensibly diminished in force and fulness.

Feeling some degree of curiosity to ascertain what effect the exclusive application of cool air, first to the pulmonary,

and then to the cuticular surface, would have on the force and velocity of the pulse, I concluded on gratifying this particular inclination by performing the two following experiments.

Experiment 6th. On examining, A. B.'s pulse was found to be at seventy-six usually full and regular pulsations the minute. Cool air, of the temperature of forty-five degrees, was respired through a long tube put through the window, while the mercury in the thermometer, was at seventy degrees in the room in which the subject of the experiment stood. On the sixteenth minute from the beginning of this process, the pulse was at seventy; on the eighteenth, it beat seventy-two strokes; and on the nineteenth minute, seventy-two. The volume of the pulse was evidently softer and smaller than it had been.

Experiment 7th. J. E.'s pulse yielded sixty-eight strokes in a minute, and regular. He exposed himself, nearly naked, to air of the temperature of thirty-five degrees of Fahrenheit, and at the same time breathed air through the tube, out of a room in which the quicksilver in the thermometer stood at sixty-five degrees. On the fifth minute of the exposure of J. E. the pulse beat only fifty-eight times; on the sixth minute, fifty-nine; and on the seventh minute it afforded sixty strokes, the size of which was diminished, and the force of the pulse was weaker than previous to the experiment.

Thus it appears from the foregoing experiments, that not only high and moderate degrees of cold, applied generally to the body, but when applied to the cutaneous and pulmonary surfaces separate, diminish the force and frequency of the pulse. "Those gentlemen," continues Dr. Klapp, "who gave me assistance in this practical department of my inquiry, can bear testimony to the unexceptionable description of not only the design, but the performance of the experiments.

They will, therefore, I hope, carry to every candid mind, all the weight and decision which have been attached to them by those persons who were present at their performance. In short, both *reason* and *experiment* pronounce cold a debilitating agent."*

I have now completed a cursory inquiry into the effects and operation of cold on the animal body. The essay has been written in too much haste to possess either perfect correctness of language, or eloquence of style; and with respect to the subject, I am forced to acknowledge it somewhat tedious. Notwithstanding, those difficult subjects immediately relating to the cure of diseases, must not be neglected because the path of their investigation happens to run through an uninviting field of science.

When the practical department of medicine shall be so improved and extended as to become most able to lessen the physical evils of mankind, then will it justly deserve to be denominated the science of humanity. For the promotion then, of both the honour and usefulness of the medical profession, *particular attention must be paid to the operation and the effects of medicine.*

Philadelphia, 1812.

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* Coxe's Medical Museum, vol. 5.

III.

Account *of the* Origin *of the* Yellow Fever *which prevailed in the City of New-York in the Summer of* 1798, *communicated in a letter to* David Hosack, M. D. &c. *from the Reverend* John M'Knight, D. D. *late Minister of the Brick Presbyterian Church, in New-York, &c.

Chambersburgh, Nov. 6, 1809.

Dear Sir,

The unsettled state which I have been in since I saw you last, occasioned by my removal from New-York, and getting fixed in this place, have hitherto prevented my compliance with your request, to furnish you with a statement of the several things which I mentioned to you in conversation, respecting the yellow fever.

I believe it is generally admitted that the sickness which was in New-York in the year 1791, and of which, about thirty, or between thirty and forty persons died, was of the same kind with that which was afterwards distinguished by the name of the yellow fever. General Malcolm was the first, or among the first of those who fell a sacrifice to it in this year. It was supposed at the time, that his sickness was occasioned by a drink of cold spruce beer when he was warm. But I understood, at the same time, that he had just returned

* Of the numerous epidemics with which the city of New-York has been visited, there is none so memorable as that which prevailed in the year 1798, both on account of the unprecedented violence with which it raged, and the great mortality which accompanied it. The many and contradictory accounts of the origin of this epidemic, which have already been published, abounding in idle conjecture and false reasoning, must give place to the interesting and satisfactory statement of the reverend author, which the editors have now in their power to offer to the public.—*Ed.*

from on board a vessel, and was much fatigued by walking in a hot sun. I had the fever the same year; I am persuaded, however, that I did not take it from General Malcolm, though I visited him the day before he died, and was with him when he died, and attended his funeral; nor from several other persons whom I visited in their sickness, or several funerals which I attended of persons who died of this fever. But I have no doubt that I received it from a man of the name of Morrison, a blue dyer, who lived at the corner of Dover and Pearl-streets. Being called upon to visit him, I found him dying, and apparently, wholly insensible. In compliance with the wishes of his friends I prayed with them. The room was full of people, the air confined and disagreeable, and here I inhaled the contagion which occasioned my sickness.

On a Monday, in a very hot day in the summer of the year 1795, Doctor Malachi Treat, who was at that time the physician of the port, called at my house about twelve o'clock: he was very warm, and his face red, like scarlet; he complained that he was very unwell, but said that he had been trying to walk it off. He told me he had been to visit a vessel the day before; that, some of the hands being absent, he had assisted in rowing the boat; that there were some on board the vessel sick; and that others had died on the passage. He mentioned to me, in particular, that there was one man dead on board, and wrapped up in his hammock; that he opened the hammock, and found a stench issuing from it exceedingly disagreeable, and different from any he had ever before experienced; and that to this he imputed his indisposition. He told me, moreover, that he assisted in conveying the corpse to Governor's Island, and in interring it there. We proposed to him to lie down, to which he consented; but after having gone part of the way up stairs, he paused, and said he must go home to

give directions about some medicine which was to be sent out. He accordingly returned home, and never went out again until he was carried to his grave, in the latter end of the same week.

In the first, or one of the first years in which the fever raged with particular violence in Philadelphia, I had occasion to go up into Pennsylvania. I made it my business to collect all the information that I could respecting the fever, particularly as relates to the communication of it to others, from those who, having taken it in the city, died of it in the country. Of the information which I received, I distinctly recollect the following instances: A young man who had been at Philadelphia with his waggon, took the fever there, and died of it at Lancaster. He was taken out of the waggon and buried; but I could not learn that any of those who had been employed in this act of humanity received any injury from it. His brother, however, who came to Lancaster to take the waggon home, and who, on the way, lay in the same bed clothes which his brother had lain in, took the fever, and died of it.

Two boys who were out in a boat, on the Delaware, fishing, found a good feather bed floating in the water; they drew it to the land and took it home. Finding no owner for it, the family made use of it. The consequence was, that five or six of the family lost their lives by it.

In the year 1798, Melancton Smith, and another man whose name I do not recollect, were the two first instances of the yellow fever in New-York. They had both been on board the ship Fame, as she came up, and I believe, both died. This same vessel went up to the New-Slip, in the East River, where she unloaded her ballast, and emptied her bilge water. The stench occasioned thereby was so intolerable, that, the wind being south, the inhabitants on the

north side of the dock had to shut up their doors and windows, and some of them left their houses. To my knowledge, as many as twelve or fifteen died in that neighbourhood in the course of two weeks, several of whose funerals I attended. This same vessel was afterwards removed to a dock in the vicinity of the coffee-house; there several persons who wrought on board of her, who resided in Eden's alley, took the fever and carried it up into that part. Just at this time there was a very heavy rain, which filled most of the cellars in the lower part of the city. The fever raged with alarming violence on Golden Hill. It assumed the appearance of the plague. Many, and among others, Doctor Foster, minister of the Baptist church, fell a sacrifice to it.

A great handle was made of a case which occurred in Barclay-street, by the advocates for the internal origin of the fever, to establish their hypothesis. The case was this; the fever broke out in a boarding house in that street, and spread to the neighbourhood on the same side of the street. It was alleged that it had originated in that place: but Benjamin Egbert told me that a carman stated to him, that whilst he carted away sugar from a vessel which lay at Rylander's wharf, the man who kept this boarding house came to the vessel and asked for the clothes of a man who had died on board; upon which a bundle of clothes was brought. He asked if they thought there was any danger in taking them; they told him they believed not, as they had been sprinkled with vinegar. He took them, and in a few days five or six persons were taken down with the fever in his house. My informant added, that in a few days after, this same carman took sick also and died.

I mentioned to you further, that in a conversation which I had with Dr. Dwight some time before, I found that we perfectly agreed in opinion respecting the origin of the

yellow fever, and that he told me the physicians in New-Haven had no doubt on that subject. He mentioned two cases which had for a time occasioned some perplexity. A man who arrived from sea, sick, was brought to a house in town, where he died. A short time after, a woman who lived in the street back from this house, also sickened and died. The difficulty was, to account for the sickness and death of this woman, as there was the length of the two lots between the two houses; as she was not known to have had any communication with the house in which the man died; as none of the family in which the man died had been taken sick, and as both were allowed to be decided cases of the yellow fever. But, on investigation, it was found that the women of these two houses had in the mean time met at the partition fence between the lots, and conversed together for some time, and that during the conversation, the woman who afterwards died, had leaned on the bed on which the man had died, and which had been hung over the fence.

The other case was that of a girl twelve or thirteen years old, who took the fever, and living in a remote part of the town, was not known to have been in any place where she was likely to take it. A short time, however, before she died, she mentioned that she had contracted her illness from some trunk or chest. "It was that (said she) that made me sick." Upon inquiry, it was found that she had been down upon the dock, where a trunk, or chest, containing the clothes of a man who died at sea, or in the West Indies, was opened. I think the doctor added that several others died of the fever who appeared to have taken it from the said clothes, and particularly the woman who washed them. Of these facts which I have stated, and

perhaps of others, you may obtain more particular information by writing to Dr. Dwight* himself.

With best respects,

I am, dear Sir,

Yours sincerely,

DR. HOSACK. JOHN M'KNIGHT.

IV.

BIOGRAPHICAL SKETCH *of the Life and Character of the Rev.* MYLES COOPER, D. D. LL. D. *second President of Columbia College, &c.*

(With an engraving, by Leney.)

MYLES COOPER, D. D. LL. D. second president of King's (now Columbia) college, was born in England, in 1735. He was educated at Oxford, where he took the degree of master of arts, in 1760, and was soon after chosen to a fellowship in Queen's college. In the following year, he published an octavo volume of miscellaneous poems, which, however, appears to have been printed two or three years before its publication; as he observes, in his preface, that the greater part of the volume "was not only written, but actually printed off before the author had seen the age of twenty-four." This collection consists chiefly of occasional poems, grave and gay; pastorals, classical imitations, and versifications of select passages of Ossian. It bears, however, no very strong marks of original poetic genius. The author, like many other young men of extensive classical and belles-lettres acquirement, appears to have mistaken taste for talent; and a quick sensibility to the beauties of classical composi-

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* President Dwight has kindly promised attention to this subject.—*Ed.*

tion, for the warmth of a poetic fancy. Hence, his poems are filled with traditionary images, and common-place mythological allusions; his wit is borrowed from Martial; and his pastorals are faint reflections of the rural scenes of Virgil, Spenser, and Pope. But his taste is correct, his versification pleasing, his command of language extensive, and his preface is written with an ease and sprightliness, which denote a mind capable of much higher things. It is not, however, to be wondered at, that his poems have shared the fate of those of many a noble and learned predecessor; and after their little day of popularity, while they *circulated in manuscript*, or were publishing by subscription, now rest undisturbed and forgotten. His reputation, as a scholar, stood so well in the university, that in 1762, when President Johnson applied to his friend Archbishop Secker, to select from one of the universities, a person qualified to assist him in the college of New-York, and in a short time to succeed him as president; that venerable and learned prelate, after much inquiry, was induced to recommend Mr. Cooper, as, in every point, fully qualified for that important station.

Mr. Cooper, after receiving priest's orders in the church of England, came over to this country about the close of 1762. Here he was welcomed with great affection by Dr. Johnson, and was immediately appointed professor of moral philosophy. The duties of this office he discharged with so much ability, that the president, who had for some time wished to retire from active life, and had only been restrained from it, by his zeal for the interests of the college, now considered himself at liberty to follow the bent of his inclination; and resigned his office, with the fullest confidence, to Mr. Cooper, who was elected President, in May, 1763, in the twenty-eighth year of his age.

The faculty of arts, then, consisted of the president; Dr.

Samuel Clossy,* an Irish physician, of very respectable attainments, who was appointed professor of natural philosophy; Mr. Harper, the professor of mathematics; and Mr. Cushing, the classical tutor; who were considered as forming the ablest body of instructors, at that time, in the colonies. Mr. Cooper soon after received the degree of D. D. and the college continued to prosper, under his direction, until the commencement of those troubles which preceded the revolution, in 1773-4. Dr. Cooper then took the side of government very warmly; and distinguished himself, as a writer, in all the political controversies of the day. Many of his pieces are marked by great strength and elegance of style, as well as by a boldness of sarcasm and severity of satire, which have seldom been surpassed. In one of these literary skirmishes, he is said to have been met and worsted, by an anonymous whig antagonist; whom he soon after discovered, in the person of one of his own pupils, Alexander Hamilton (afterwards Gen. Alexander Hamilton) then a student at the college of New-York. It would be injustice to the memory of Dr. Cooper, not to add, that far from betraying any thing like mortification or resentment, he uniformly treated his youthful antagonist with good humour, and even respect.

His writings and conversation soon attracted the popular indignation; and he was obliged to fly from the college to escape the fury of a mob. In 1776, he returned to Eng-

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* Dr. Clossy had, previous to his arrival in America, attained a high degree of eminence in the medical profession, both as a practitioner, and as the author of an interesting volume on morbid anatomy, entitled, "Observations on some of the diseases of the human body; chiefly taken from the dissections of morbid bodies," published in London, in 1763. Upon the organization of the first medical school in New-York, in 1768, he was chosen the professor of anatomy; and, in conjunction with Bard, Middleton, Jones, and Tennent, successfully directed his labours to the establishment of that institution. See the Register, vol. ii. p. 230.

land, and resided for some time at Oxford ; where, in 1777, he preached a sermon before the university, "on the origin of civil government," which was published in quarto, and gave rise to some controversy on the points in dispute, between the whig and tory parties of that day. He was afterwards minister of the first episcopal chapel at Edinburgh, where he officiated, to a very respectable congregation, until his death, in 1785.

Dr. Cooper was a thorough bred Oxford scholar, with all the learning, and all the favourite opinions of that ancient seat of loyalty and literature. His moral character was without reproach ; but the more precise were sometimes offended, by the freedom and conviviality of his habits. One of the peculiarities of his conversation has been preserved, by a rival wit of the same period :

> And lo ! a mitre, now, is spread,
> O'er *punster* Cooper's reverend head.
>
> M'FINGAL.

The college over which he presided, was broken up by the tumults and confusion of the revolutionary war. The course of instruction was suspended, the professors and students scattered, the building converted into a military hospital, and the valuable library pilfered and dispersed.*

This state of things continued, till 1784, when the college was re-organized, under the name of Columbia college ; and William Samuel Johnson, Esq. son of the first president, and a gentleman, in every respect, qualified for so important a station, was chosen to preside over it.

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* This library formerly contained, besides the collections left by Mr. Murray and Dr. Bristowe, some very splendid presents of the Earl of Bute, and a donation from the University of Oxford, of a copy of every work which had been printed at the university press.

V.

OBSERVATIONS *on the* SURGERY *of the* ANCIENTS, *vindicating their claims to many of the reputed discoveries and improvements of modern times: delivered as an Introductory Discourse to a course of Lectures on Surgery and Midwifery. By* DAVID HOSACK, M. D. *Professor of the Theory and Practice of Physic and Clinical Medicine in the University of the State of New-York.*

To those in pursuit of knowledge, it is no less interesting to observe the rise and fall of the empire of learning than of states.

In like manner, introductory to a course of lessons upon any art or science, we are naturally led to inquire into the first beginnings or sources whence it arose, and to trace its progress as it advances to perfection.

Introductory to the other parts of the course, I therefore propose, at this time, to call your attention to the most important facts which the history of surgery presents; more especially, as it was practised among the Greeks and Romans: we shall thence learn that the writings of the ancients have not only given origin to most modern improvements, but that very many of them that have been claimed as original inventions, if they have not been copied, are, at least, anticipated in these fruitful sources of instruction.

In the early ages of society, external accidents constituted the greatest evils to which man was exposed. Intemperance, luxury, and the refinements of civilized life, had not then impaired his bodily constitution, nor debauched his mind. He passed his days in the exercise which was necessary to procure the means of his subsistence, and devoted his nights to rest, undisturbed by care, or those anxieties

which at present occupy the civilized portion of the human race.

Man, in a state of nature, was therefore subject to, comparatively, but few diseases; though he was probably not less exposed to the common casualties of life than at the present day. In climbing the tree to procure its fruits; in traversing the forest, he was necessarily exposed to ordinary accidents; his attention, therefore, would be first directed to the discovery of such remedies as were calculated to remove the evils thus induced. To restore to its socket the dislocated bone, or to replace it when broken; to heal the wounds inflicted by the beast of the field, or the venomous serpent, must necessarily have been among the first objects of his attention. Accordingly, it is observed by Celsus and other ancient writers, that surgery was cultivated before any other branch of medicine.

The first writers upon physic trace the origin of their art, in common with all other branches of knowledge, to the Egyptians. But the history of surgery, as practised by that people, is so involved in fable, so blended with the pagan mythology, that, notwithstanding the labours of Prosper Alpinus, it is impossible to ascertain their knowledge of medicine, or of any other branch of science. The operations of surgery, stated by the professor of Padua, as having been performed by the Egyptians, namely, the extraction of the stone from the bladder; bleeding in the veins and arteries; the application of the actual cautery, and the paracentesis of the abdomen, in dropsy, must probably have been the operations of the modern and not of the ancient Egyptians.

Let us, therefore, pass over the stories of Hermes and the Egyptian Æsculapius; the fabulous accounts of Osiris, Serapis, Isis, Horus, and Thonis, who were reputed the first practitioners in medicine, and ranked among their divinities,

to the more authentic history of the surgery of the Greeks, as related by Homer and Hippocrates.

The first Greek surgeons, on record, are Æsculapius and his sons Machaon and Podalirius. Æsculapius flourished about fifty years before the Trojan war; in that war his two sons distinguished themselves, not only by their valour, but by their skill in curing wounds.

In the Iliad, Machaon is spoken of as one of the most distinguished surgeons at the siege of Troy. He is called the *preserver of the Greeks;* and when wounded by Paris, he is lamented, as deprived of the benefit of that skill which he had so often exercised for the benefit of others.

> "The great Machaon, wounded in his tent,
> "Now wants that succour which so oft he lent.*

On another occasion, Homer shows the high estimation in which the profession was held :—

> "A wise physician, skilled our wounds to heal,
> "Is more than armies to the public weal."†

Of Podalirius too, it is said, that on his return from the destruction of Troy, he was driven upon the coast of Caria, and that he cured the daughter of Damæthus of a severe and dangerous illness, by bleeding her in both arms. This is the first authentic record of the operation of blood-letting. It is also stated, as an evidence of the value attached to the

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* ——————— Μαχάων,
Τὸν μὲν ἐνὶ κλισίῃσιν ὀΐομαι ἕλκος ἔχοντα,
Χρηΐζοντα καὶ αὐτὸν ἀμύμονος ἰητῆρος,
Κεῖσθαι·

† Ἰατρὸς γὰρ ἀνὴρ πολλῶν ἀνταξιος ἄλλων,
Ἰοὺς τ' ἐκτάμνειν, ἐπί τ' ἤπια φάρμακα πάσσειν.

profession, at that early day, that the prince, as a reward to Podalirius, for his skill and services, gave him his daughter in marriage, with half of his kingdom as her portion.

Notwithstanding these testimonies of the skill of Machaon and Podalirius, it appears that the practice was very much confined to the removal of the darts or arrows with which their wounds were inflicted, and afterwards to the application of fomentations and styptics to the wounded parts; for, when the heroes, recorded by Homer, were in other respects severely injured, as in the case of Æneas, whose thigh bone was broken by a stone thrown by Diomedes, he makes no mention of any other than supernatural means employed for their relief.

In the writings of Hippocrates, we have a full and circumstantial detail of the state of medicine and surgery among the Greeks in his time. He lived about 400 years before the birth of Christ; and was the first who treated of medicine in a regular or systematic manner. Prior to his time, even among the Greeks, the practice of medicine was confined to their priests and philosophers. According to Celsus, the healing art became united with the duties of religion, from the consideration, that diseases were inflicted upon mankind as punishments for their crimes; and were only to be averted or removed by the intercession of their priests, and the remedies they prescribed. The connection which exists between the study of medicine and the works of nature, also led their philosophers to unite the healing art with their favourite pursuits; and it is related of Pythagoras, that he travelled from place to place, not so much to teach the peculiar doctrines of his philosophy as to practise physic. Thales, Empedocles, Heraclitus, and Democritus, were among the most distinguished of the Grecian philosophers. They were also celebrated as eminent practitioners of medicine and surgery.

Such was the unsettled state of medicine, until the time of Hippocrates. In his hands it assumed the form of a distinct science, and was practised as a separate profession. By his labours it became enriched with his valuable and numerous observations on the symptoms, causes, and cure of diseases; and since his time, has been respected and cultivated, as among the most important of human pursuits.

Hippocrates not only rescued the profession from the hands of ignorance and superstition, but in his works he has left a legacy of great value to the surgeon, as well as to the physician; and although they are the writings of the most ancient author, whose pages are preserved, and written at a period, when the structure of the human body, and the functions of the animal economy, were but imperfectly understood; they are the writings of a master, and like the tablets whence he collected many of his observations, they deserve, even at this day, a place in the temple of science, where all can read and profit from the valuable truths they contain.

Among the surgical works of Hippocrates, are a treatise on *Wounds*, a book on *Ulcers*, another on *Fistulas*, a fourth on *Fractures*, and a fifth on *Dislocations*. His observations on abscess, ulcers, and wounds, show him to have been an accurate clinical observer. His work on the joints and dislocations, contain many practical remarks of great value on those subjects. His aphorisms contain principles which are received as so many axioms in physic and surgery; and, at this day, constitute the subjects of academic exercises in the most distinguished universities.

He performed the operation of bloodletting in different parts of the body; and although he did not understand the circulation of the blood, his observations on the effects of this evacuation, and the diseases in which it is most useful, are judicious and correct. In apoplexy, palsy, inflammatory diseases, iliac passion, quinsy, pleurisy, and inflamma-

tion of the abdominal viscera, &c. he made free use of this remedy. In quinsy, and in injuries occasioned by falls, he attached so much importance to bloodletting, that he, in some instances, bled his patient in *both arms*, and frequently *ad deliquum*.

In the treatment of fevers, he was no less cautious in the use of the lancet, than he was bold to employ it in those diseases in which it was decidedly indicated. At the same time that his ignorance of the circulation of the blood occasionally led him into error, the indications of bloodletting, and the circumstances in which it was most advantageously performed, did not escape his notice. The season of the year, the age of the patient, and habit of body, were no less regarded by Hippocrates than they are by physicians and surgeons of the present day. But he was not confined to the use of general bloodletting; he also made use of cupping and scarification for the removal of local diseases.

Hippocrates also performed many other operations, which at this time, notwithstanding the present improved state of anatomy, call for considerable skill and judgment in the operator.

He opened deep seated abscesses; he performed the operation of tapping in dropsy, and of trepanning in fractures of the skull and injuries of the brain. His aphorism upon the comparative pain and fever, before and after the formation of matter, and which he made the guide of his practice, abundantly shows his accurate knowledge of this subject. His observations on wounds of the head, teach us the great caution with which he formed his prognosis of the event. However small or inconsiderable the injury may appear, he observes, they require attention in their treatment, and care in the practitioner, not to hazard a hasty prognosis of the issue. This observation would do credit to the most enlightened surgeon of modern times; and cannot fail to im-

press us with an exalted opinion of the talents and experience of Hippocrates.

The *actual cautery* was also one of his favourite remedies, in the treatment of chronic diseases. In a case of ascites, he cauterized the belly eight times, during the forming state of this complaint. The physicians and surgeons of this day have yet to learn many valuable lessons from Hippocrates, and other ancient physicians, relative to the use of this remedy. The successful practice of Pouteau, of Lyons, (see his surgical essays) who has revived the use of this external application; and the advantages which have resulted from the use of caustics, as prescribed by Mr. Pott, in diseases of the spine, tend to establish the importance of the principle upon which the actual cautery was prescribed, and has been found useful.

Many other local applications were made use of in the practice of Hippocrates, that are still employed by the physicians and surgeons of this day.

In an inflammation of the throat, he caused his patients to inhale the steam arising from the infusion of stimulant and aromatic herbs: upon other occasions, he directed fomentations to be applied to the parts affected. The warm bath, fomentations, gargles, ointments, cataplasms, and collyria, were also among the local remedies prescribed by this celebrated physician.

The important operation of lithotomy appears, also, to have been performed in the time of Hippocrates; for, in the oath administered to his pupils, he exacts from them the obligation, that they *would not cut for the stone.*

Although the operation, as performed by the surgeons of that day, was apparently simple, compared with the present lateral operation; still, from their imperfect knowledge of the structure of the human frame, it must necessarily have been attended with considerable danger. Even, as improv-

ed at this time, it is an operation frequently productive of dangerous consequences; and, in some instances, proves fatal in the hands of the most skilful surgeon. The conduct of Hippocrates, therefore, in prohibiting his pupils from performing so important an operation, at the time the anatomy of the body was imperfectly understood, must give us a high opinion of the correctness of his judgment and his prudence; at the same time, that it attaches an additional value to his works.

Such was the state of surgery, in the days of Hippocrates: after a life spent in the duties of his profession, to which he devoted himself, with unwearied industry, he died, in the 101st year of his age; but in his works, he still lives.

In the interval of time, between Hippocrates and Celsus, many surgeons are recorded, by Galen and other historians: but as they appear to have made but few and inconsiderable improvements in the art, we will pass over this period, to the Augustan age; which may also be denominated the Augustan age of medicine, as well as of science. Such it was rendered by Celsus, the Roman Hippocrates.

Celsus was not only distinguished for his professional acquirements, but ranks among the most celebrated writers of antiquity. Whoever, therefore, wishes to become acquainted with the state of medicine and surgery, prior to the fall of the Roman empire, or to read the Latin language, which, in that day, attained its greatest purity and elegance, will peruse his valuable pages; which have gone through almost innumerable editions, and have been translated into almost every language employed as the vehicle of learning. Celsus not only exhibits an historical view of the state of medicine, as practised before his time, but has added much original observation, and many improvements to those of his predecessors. Although he has copied much from the writings of Hippocrates, he was not so blindly attached to his works, as

not to discriminate between his merits and his defects. On the contrary, while he gave the opinions and practice of others, he thought for himself. His works are accordingly esteemed the most valuable repository of the medical learning of his time. He treats of the healing art, in all its branches of *diet*, *medicine*, and *surgery*. His seventh and eighth books are exclusively devoted to the latter subject, and contain a systematic view of most of the diseases and operations which fall to the province of the surgeon.

In his observations on *wounds*, *abscesses*, and *ulcers*, he describes the various appearances they assume, and adapts his remedies to the different stages, with as much correctness as is done by the surgeons of this day. To wounds, accompanied with hemorrhage, he applied constant pressure, by means of a sponge, wet with vinegar. If necessary, he applied the ligature to the bleeding vessel, or closed its orifice, by the actual cautery. When attended with inflammation, he enjoined abstinence upon the patient, and covered the part affected with cold applications. In *contusions*, he freely opened the bruised part, or dilated the wound for the evacuation of the blood effused, when there was no danger of injuring the larger blood-vessels, or important nerves. In gangrene, occurring in the extremities, he cut down to the sound parts; and if he failed, by that and other efforts, to conquer the disease, he recommended the amputation of the limb. To promote the suppuration of abscesses, he employed poultices, composed of barley, meal, marsh mallows, or linseed and fenugreek; but when opened, he prescribes stimulant food and drinks, and to the parts he applied honey and other digestives. When the lips of the wound became callous, its surface spongy and insensible, and the discharge of an unhealthy appearance, he washed the wound and the surrounding parts with *wine*. From this practice of Celsus, the surgeons of the present day may learn an important

lesson in the treatment of wounds. He also describes the symptoms of that dangerous abscess, the *carbuncle*, and advises the actual cautery to corrode the gangrened part. This practice is now superceded by the internal and external use of the peruvian bark, and other stimulants. In erysipelas, he applied cerussa, with the juice of *solanum*, a powerful sedative. In the treatment of the callous ulcer, he removed the hard edges with the knife, or corrosive applications. In cancers, and in the cancerous ulcer, he prescribed the auripigmentum or arsenic. In fistulous ulcers, if tortuous in their course, with the probe as his guide, he ascertained their direction; divided them freely with the knife; and, upon exposing their internal surface to view, he removed the callous portions, and applied such dressings as were calculated to promote the growth of new parts. In other instances, he effected a cure, by the use of stimulant and corrosive injections. In caries of the bones, he directs them to be perforated as deep as the disease extends, and afterwards a hot iron to be passed into the foramina, made by the perforator, for the purpose of drying and separating the diseased portions: but if the caries and blackness extend through the body of the bone, he advises a total separation of the part affected.

In his chapter on tumours, he described them according to the nature of their contents, and advises their extirpation. The *steatomatous* tumour, from the firmness of its consistence, he directs to be carefully separated from the skin and surrounding parts, and to be removed entire, without dividing the sac inclosing it. He then directs the lips of the wound to be brought together, and an application made to agglutinate the divided parts; at the same time, making use of wine and other external stimulants, to promote their union. In this treatment, we see the improvements of the present time, of *saving skin*, and *healing by first intention*. That this was the

object of Celsus, appears evident, from a subsequent direction which he gives, in case any portion of the sac should be left behind, as in the removal of the melicerous or atheromatous tumour; in which case, he orders the wound to be left open, and digestives to be applied, for the purpose of throwing off the remaining portion of the sac. In the atheroma of the eye-lids, in which the sac adheres very slightly to the surrounding parts, he directs the teguments to be divided, without wounding the sac, and the tumour to be removed by the fingers, without further dissection; for, he adds, it easily separates. The same mode of treatment you will find recommended in the work of Mr. Hey, as a valuable improvement of the present time. In his chapter, on diseases of the eyes, Celsus treats of the *cataract*, and directs it to be depressed by the needle; and if it rises again, to be broken into pieces; the practice recently adopted by the most eminent surgeons. In *ophthalmia*, he prescribes venesection, purgatives, abstinence, low diet, rest, and a dark room. He washes the eye with collyria, composed of an infusion of roses and the poppy. When attended with defluxion, he employs astringents, cupping, and the actual cautery, to the temple and forehead, analogous in its affects to blisters and issues, as at present prescribed, under similar circumstances.

Celsus also performed the operation of the hare-lip. He extirpated the polypus from the nose; he removed, by excision, the enlarged and indurated tonsils; he diminished the elongated uvula; and he removed the bronchocele, by caustics and the knife. But the skill of Celsus was not confined to the smaller operations of surgery.

In diseases of the bones of the head, and in injuries of the brain, his practice was such as the most eminent surgeons of the present day must approve. The symptoms which are occasioned by a fracture of the skull, are minutely detailed. He is the first who notices the rupture of the vessels of the

brain, and the other effects produced by a concussion without fracture of the cranium. He also observes, that the evidence of such injury, is generally a pain immediately above the part affected; and, upon exposing the bone to view, he adds, it is found of a *pale colour*. This characteristic symptom of effusion of blood, or of the formation of matter between the cranium and the membranes of the brain, you will find contained in the works of Mr. Pott; but without the credit due to that accurate observer. In cases of this sort, and in fractures of the skull, it was the practice of Celsus to make a free crucial incision of the integuments; by which, alone, in many instances, the patient was relieved. At the same time, he condemns the precipitate conduct of his predecessors, in proceeding to the use of the trepan, without waiting to observe the effects of other remedies.

The practice of Celsus is, at present, pursued under similar circumstances, by that celebrated surgeon, Mr. Abernethy, of Bartholomew's hospital; who has, in numerous cases, dispensed with the trephine, having relieved his patient by the application of other remedies. But if the symptoms became more formidable, and the patient experienced no benefit from the first operation, Celsus then directed such portions of the bone to be removed, as the extent of the injury appeared to require. In those cases, where the fracture or depression was small, he employed the instrument called the *modiolus*; which, in its construction, is similar to the trephine. But when the fracture was extensive, or of an irregular shape, he made use of a perforator, so as to surround the part affected with holes; and afterwards employed the chisel and mallet to cut out the portion of bone inclosed within them. In this operation, large portions were removed, which the modiolus could not cover, unless frequently applied. Mr. Hey, of Leeds, has lately introduced a substitute for the trephine; by which the same

advantages are obtained, as by the perforator and chisel of Celsus.

As anatomy, in those days, was very imperfectly understood, we cannot be surprised that Celsus was less successful in some of the more complicated operations of surgery. Accordingly, in reducing strangulated hernia, he experienced great embarrassment: but it is to be recollected, that this operation requires an accurate knowledge of the structure of the parts concerned, to guide the knife of the operator. This knowledge has only been acquired within a few years. In the hands of John and Charles Bell, Mr. Astley Cooper, of London, and Mr. Hey, of Leeds, this operation has received its best and most important improvements. But in the history given by Celsus, of the symptoms and causes of hernia, and of the nature of its contents, he is no less perspicuous than upon most other subjects that came under his notice. He describes, with great accuracy, most of the species of hernia, now found in books of surgery, except such as occur under Poupart's ligament, and that which takes place between the abdominal muscles. The umbilical hernia he distinguishes into the omental and intestinal, according as the omentum or intestine is contained in the hernial sac. In like manner, he describes the scrotal hernia, as containing omentum, intestine, or both combined, with the symptoms which characterize each species.

He also distinguishes scrotal rupture, as it occurs in the young child, and in the adult. In the former, he directs a compress to be applied to the part, and retained by means of a roller; by which application, he observes, the intestine is oftentimes forced in, and the coats agglutinated: but in the adult, when the intestine is protruded in a large quantity, and attended with symptoms of danger, it appears that he was unacquainted with the mode of replacing it within the

abdomen. He observes, it can only be reduced as far as the groin ; thereby producing a change, but not a termination of the disease : and in those cases, where he considered an operation necessary, he did not restore the displaced intestine, but by means of a ligature or the knife, he diminished the quantity of loose skin, and by the inflammation and thickening of the parts induced, formed a cicatrix, which was calculated to prevent an increase of the prolapsus. Upon the same principle, in umbilical hernia, when the parts protruded were restored to their natural situation, he excited inflammation by ligature and caustics ; which so changed the structure of the parts, as to prevent a return of the rupture. Thus far his operation was successful ; but in some instances, from want of anatomical knowledge, he considered it necessary to remove parts which have no connection with the disease. In hernia of the intestine, he sometimes removed not only a portion of the hernial sac, but also extirpated the testicle itself.

In hernia of the omentum, if small, he replaced it by the hand alone ; and to prevent it from being again protruded, he applied a compress to the part, and secured it by a bandage passed round the loins: but if large, he did not attempt to reduce it. He then, to effect a separation of the mortified parts, made use of escharotics or ligatures, preferring them to the scissors or knife, on account of the hemorrhage which attends the use of cutting instruments. The same observation is made, and a similar practice adopted by Mr. Hey, of Leeds.

Celsus also performed many other operations in diseases of the abdomen and pelvis, including the organs of generation. In wounds of the intestines, he performed the operation of gastroraphy ; and his description of the mode of performing it, corresponds with the directions given by the best

writers of the present time. In the treatment of dropsy, he performed the operation of tapping, not only on the side of the belly, but, in some instances, he perforated the navel; which is considered, at this day, as the latest improvement in the manner of performing paracentesis. The hydrocele, circocele, and the inflammation of the testicle, are also well characterised by this accurate observer. He cured hydrocele by incision. The varix of the spermatic cord, as well as the varices of the veins of the legs, he cured by laying bare the vein thus enlarged, and by applying the actual cautery; or removed it by excision, having previously separated the vein, and inclosed it with ligatures, above and below the part to be removed. He divided the prepuce in phymosis; he introduced the catheter in retention of urine, both in males and females. Celsus also performed the important operation of lithotomy; but considered it as attended with great danger. He very judiciously prepared his patient for this, as for every other capital operation, by abstinence from solid food and stimulating drinks. His mode of operating, was, in some respects, peculiar to himself; and was hence denominated *lithotomia Celsiana;* but, in most circumstances, it agreed with that afterwards adopted by Paulus Ægineta, and others, by the apparatus minor, or cutting on the gripe. When the operation was finished, he bled his patient, enjoined abstinence, made use of a warm bath, and oily fomentations, to diminish inflammation: but he advised the operation to be performed only in the spring of the year, and confined it to patients between nine and fourteen years of age.

These facts teach us, that Celsus was not sufficiently acquainted with anatomy to perform this operation, without great hazard to the patient. At this we cannot be surprised, when we recollect that it is only within a few years that it has been performed with general success. Our only sur-

prise should be, that the art of surgery was so well understood as it appears to have been in his day. Among other operations, he extracted the dead fœtus from the womb, by means of the crotchet; and when difficulty presented, he divided the child, and removed it piece-meal. To restrain hemorrhage, or to remove any inflammation, induced by the operation, he applied soft cloths, wet with an infusion of vinegar and roses. Condylomata (or tubercles of the anus) and hemorrhoidal tumours, he removed with the knife and ligatures. The same treatment you will find adopted and recommended by Mr. Ware, in his valuable essay on that subject; but which contains no reference to the practice of Celsus. Fistula in ano, he also cured by ligature, making use of a linen thread instead of the leaden wire, employed by the moderns. This mode of treating fistula, was revived by Foubert, and has been frequently practised in France since that time. Professor Camper has also made use of ligatures, in those whom he found fearful of the knife; or when the patient could not submit to the necessary confinement which the incision requires. But the great inconvenience which arises from the long continued irritation of the ligature, and the prolapsus ani, which it sometimes produces, have occasioned it to be laid aside.

Celsus was no less successful in the treatment of fractures and dislocations. His directions for reducing the fracture of the clavicle, and his treatment of fracture of the ribs, correspond with those contained in the present systems of surgery; and in fractures of the extremeties, although he did not employ the many tailed bandage, or place the broken limb in a flexed position, but confined it to the fracture box, he remarks, that the smaller bones were generally united between fourteen and twenty-one days; those of the leg and fore-arm, between twenty and thirty; and those of the arm and thigh-bone, between twenty-seven and forty days. Few

surgeons of the present time, I believe, can boast of greater success.

An eminent modern physician, emphatically exhorts every person, in the study of medicine, to keep Celsus in his hands, by night and by day. I trust the outlines I have exhibited of his practice of surgery, and the evidences I have adduced of his skill in that art, will also induce the pupil in *surgery* to give his writings an attentive perusal.

Galen, the physician of the Emperor Marcus Aurelius, also holds a distinguished place in the history of surgery. He was born at Pergamus, a city of Asia, about 130 years after Christ, and during the reign of the Emperor Adrian. He was celebrated, not only as a practitioner in physic and surgery, but as the most accurate anatomist that had then appeared. His knowledge of anatomy, at the same time that it furnished him with more correct views of the functions of the human body, and of the general principles of surgery, also enabled him to perform some operations, unknown to his predecessors. By some who profess to give an account of his works, he is considered as the mere commentator on the writings of Hippocrates; especially upon those subjects which relate to surgery. But although Galen selected every thing he considered valuable in the works of those who had gone before him, he has left the evidence of great original genius, not only as a physician, but as a practitioner of surgery. I may remark, that his writings, like those of Celsus, have been plundered by the moderns, without the least acknowledgment of the source whence they derived the materials of what they afterwards denominated discoveries and improvements.

Without going into a detail of the practice of Galen, I shall confine my remarks to a few of those subjects in which he appears to have added to the stock of knowledge he had received from his predecessors.

In his chapter on ulcers, he distinguishes their several species with so much correctness, that it has evidently been the basis of Mr. Benjamin Bell's treatise upon this subject. Not only the names by which they were designated, by Galen, are retained; but even his definition of an ulcer has been adopted by our late systematic. "A solution of continuity, in any of the softer parts of the body," is the definition given of an ulcer by Mr. Bell. "Unitatis solutio est in carnosa parte," is the language of Galen. I may also add, that in the treatment of ulcers, there is scarcely what is called an improvement in the practice of the moderns that was not known to Galen. During the inflammatory stage of phlegmon, he carefully enjoined upon his patient to abstain from wine and stimulants generally. He also made use of the lancet, purgatives, and warm bathing, to diminish the inflammation; but when the ulcer was formed, and a free discharge of matter obtained, he directs his remedies according to the character of the wound. In the simple purulent ulcer, his practice was to bring the edges as nearly as possible into contact. In the sordid ulcer, he made use of honey, verdigris, and terebinthinate applications, to change its condition, and to promote the growth of healthy parts. Oily dressings and relaxing cataplasms, he very properly proscribed as injurious in those cases. With the same view of restoring a healthy action in the part, he directs it to be washed with wine; and, as an evidence that he had in view its stimulant qualities, he observes, that the Falernian, which was a sweet wine, was useless in this respect. "Nam quecunque dulcia pariter et fulva sunt, ut Falernum, ad id inutilia existunt."

But one of the most approved modes of treating ulcers, in the present day, is by bandage. This, also, was the practice of Galen; and in his direction upon the application of the roller, he observes, it should not be so loose as to give no sup-

port to the limb, nor bound so tight as to excite pain by its pressure. "Circumductio etiam ipsa non ita laxa sit ut nihil efficiat nec ita vehemens ut dolorem premendo excitet." In punctures of the nerves, the practice of Galen was also original. If the wound be large, he advises it to be kept open; but if small, he directs it to be dilated, and terebinthinate and other stimulating dressings to be applied, for the purpose of obtaining a free discharge from the surface of the wound. "Ubi aliquis nervus est punctus, cutem ipsam servari oportet, aut quod tutius est latius incidere." In warm climates, the same practice is successfully pursued under similar circumstances, in the present day.

For the purpose of suppressing hemorrhage, when the external application of cold water and astringents failed, such as unripe galls, balaustines, and the stronger austere wines, it was the practice of Galen to raise the bleeding vessel, by means of a hook, and to secure it by a vinculum or ligature. Ambrose Paré, in the sixteenth century, therefore unjustly claimed the use of the ligature as his discovery.

The aneurismal tumour is also well characterized in the writings of this celebrated surgeon. From some expressions contained in his work, I am also induced to believe, that in the treatment of fractures, he placed the broken limb in a flexed position. It was certainly his practice, when the bones were secured by bandage, to place the limb in that situation which occasioned the least pain to his patient; and in the application of the bandage, he was aware of the inconvenience and injury arising from too severe pressure upon the part affected. To aid the generation of bony matter, in forming a callus, he also, as in wounds of the soft parts, made use of wines and other stimulating applications.

Two other writers of respectability, among the ancients, merit our attention, Ætius and Paulus Ægineta. I pass

over the works of Oribasius, as they contain nothing important, but what is to be found in the writings of Galen.

Ætius flourished at the end of the fifth and beginning of the sixth century. He was born at Amida, in Mesopotamia, and was educated at the celebrated medical school of Alexandria. Although his works are not so well digested or arranged as those of Paulus, his chirurgical writings contain many valuable observations, not to be found in Celsus or Galen, and were even omitted by his successor, Paulus. His account of the diseases of the eyes, is much more minute and complete, than the chapter of Celsus upon the same subject. In the treatment of anasarca, he prescribes scarification of the extremities; not merely for the purpose of a temporary evacuation of the water contained in the cellular membrane, as had been recommended by Hippocrates, but made his incisions so bold and extensive, that he thereby, according to his own observation, not only relieved his patient of anasarca, but frequently cured him of ascites. Sylvius de la Boe, afterwards proposed to perform this species of tapping, by means of a needle, and claimed the discovery as his own.

I have already remarked, that Hippocrates and Celsus made frequent use of caustics, especially in the treatment of dropsy, epilepsy, sciatica, and phthisis. Ætius also employed them, not only in the same complaints, but in many other diseases. In asthma, palsy, empyema, and affections of the head; in obstinate head-aches, or in injuries of the brain, he applied them to the nape of the neck, and to different parts of the head. He directed them to be long continued, to be applied in great numbers, and made of a circular shape, that they might be slow to heal, and thereby afford a large discharge. In the bite of a mad dog, he directed them to be kept open forty or sixty days; and if, in that time, they should, by accident, be closed, he renewed their

application. In this free use of caustics, he was followed by Paulus. The issues, as employed at this day, are found useful in the same diseases, for which the caustics were so successfully applied by the ancients. It is said by some, that the use of the *seton* was known to Ætius: this does not appear. Roland, of the tenth century, was the first who described this species of issue. It was afterwards spoken of by Rhazes and Albucasis, as much in use in their day. Dr. Freind remarks, that whoever reads the chapter of Rhazes on this subject, will find that the ancients understood the value of this remedy as well as the moderns.

Ætius also treated of the diseases of women. He notices the causes of difficult labour, and directs the mode of delivery, which should accordingly be pursued. In one respect, his work is imperfect; as he takes no notice of an important branch of surgery, fractures and dislocations.

Paulus Ægineta, so called from his birth-place, the island Ægina, flourished about the middle of the seventh century. He also was a pupil of the Alexandrian school. After finishing his education, he travelled into different countries, and thereby had more extensive opportunities of becoming acquainted with diseases than most of those who had preceded him. His works, accordingly, contain much original matter. His chirurgical writings, in which he devoted a book exclusively to the operations of surgery, have been universally considered as more complete than any that appeared before the revival of learning in the fifteenth century. It is sufficient evidence of the value of the works of Paulus, that his writings, with those of Celsus, became the text books of Fabricius, a celebrated surgeon of the sixteenth century.

In his treatise on ruptures, the different species of hernia are more minutely detailed, and the operation more circumstantially described than by Celsus. That species of aneurism, arising from a wound or rupture of an artery, which

was known to Galen, he describes with great accuracy, as well as the circumstances by which it is distinguished from other tumours. This is not all. In the treatment of the disease, he performed the operation for its removal, in the same manner as is done at this day, by securing the vessel above and below the part affected, and dividing it between the ligatures. He also describes the fracture of the patella, which was not noticed before his time. In chronic affections of the head, and in diseases of the eyes, he opened the jugular veins; and, in some instances, the arteries behind the ears. To render the operation of cupping more effectual, he improved the scarificator in such manner as to make several incisions at the same time. In cases of quinsy, threatening suffocation, he performed the operation of bronchotomy. He directs it to be performed about the third or fourth ring of the trachea, being a part which he observes is less covered with flesh, and where there is the least danger of dividing many vessels. He is also careful not to make the aperture larger than is sufficient for the purpose of respiration. In this operation, Albucasis afterwards copied Paulus, without an acknowledgment.

Paulus also improved much upon his predecessors, in the manner of performing some of the more usual operations of surgery. In extracting the stone from the bladder, he did not, like Celsus, confine the operation to childhood, but performed it at any period of life. He also directs the incision to be made, not in the middle of the perineum, as was done by Celsus, but upon the left side of it, nearly where the incision for the lateral operation is at this day made. Upon this subject, he also gives another important direction; to make the external incision free and large, by which both the sufferings of the patient and the danger of the operation are diminished. Paulus also treats of the diseases of pregnancy, and was skilled in the practice of midwifery.

Such was the state of surgery among the ancients; and from the progress they had made, much also was to be expected from the labours of their successors: but a long interval of ignorance and darkness now ensues.

The civilized parts of Asia and Africa were overrun by the Saracens, under Mahomet and his successors. Being, from their religious tenets, the professed enemies to all knowledge not contained in the Koran, they ordered the celebrated library of Alexandria to be destroyed; and with it all the liberal arts had nearly perished.

About the same period, the Goths and Vandals overran the Roman empire. They also were the enemies of science, because they were strangers to it. But after the fury of the Saracens had somewhat subsided, the love of health and life, which is natural to man, induced them to revive the healing art; which had, in a great degree, shared the general fate of learning. The works of Hippocrates and Galen were sought for, and translated first into the Syrian, and thence into the Arabian language: in a few centuries, the Mahomedan governments abounded in schools of physic. Although the works of the most celebrated Greek and Roman writers were transcribed by the Arabian physicians, Rhazes and Avicenna, the science of medicine received little improvement from their hands. In like manner, the knowledge of surgery, among the Arabians, was preserved, but not improved. The precept of Mahomet, which forbad the opening of dead bodies, must necessarily have prevented improvements in anatomy, and consequently retarded their progress in the practice of surgery. Notwithstanding the labours of Rhazes, Avicenna, Albucasis, and other eminent practitioners and teachers of medicine among the eastern nations, surgery received few or no additions, from the time of Paulus until the sixteenth century; when Fabricius, of Aquapendens, published his celebrated system, contain-

JOHN JONES M.D.

For the Med. and Phil. Register.

ing, not only the surgery of the ancients, but many original observations, which may be perused with much interest, even at this day. Of Fabricius, Boerhaave observes, "ille superavit omnes;" "omnibus potius quam hocce carere possumus."

Upon some future occasion, I propose to take a view of the progress of this art, from the revival of learning to the present period; in which I shall enumerate the advantages which the practice of surgery has derived from the discovery of the circulation of the blood, and the subsequent improvements in anatomy and the other branches of the healing art.

VI.

Account of the Life and Character of the late JOHN JONES, M. D. *formerly Professor of Surgery in King's (now Columbia) College, New-York, &c.**

(With an engraving, by Leney.)

JOHN JONES, the subject of these memoirs, was a native of the state of New-York. He was born in the town of Jamaica, Long-Island, in the year 1729; and received his education partly from his excellent parents, but chiefly at a private school in the city of New-York. He was early led, both by the advice of his father and his own inclination, to the study of medicine, and was placed under the care of the

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* With great pleasure we present our readers an account of the late *Dr. John Jones*, of New-York, a gentleman alike distinguished for his professional merit, urbanity of manners, and moral excellence. The narrative is extracted chiefly from the memoirs of his life, written as early as 1795, by his pupil, *Dr. James Mease*, of Philadelphia, who has kindly favoured the editors with a corrected copy for publication in the Register.—*Ed.*

late Dr. Thomas Cadwalader, of Philadelphia, with whom he continued during the period of his studies in this country.

At the age of eighteen years, he began to study medicine under the above-mentioned physician, and he always acknowledged, with pleasure and gratitude, the important instructions, both in physic and morals, which he derived, during the prosecution of his studies with that amiable man.* This country then afforded scarcely any opportunity by means of public institutions, for increasing the knowledge of the student; as none of those numerous establishments for the relief of the indigent sick then existed, which now do honour to a young, but enlightened country. The private practice of physicians, was almost the only source from whence the student could derive any practical information; and to this Dr. Jones paid the greatest attention.

After completing his studies in this country, young Jones visited Europe, in order to improve himself still further in his profession. He first went to London, and there attended the lectures of the celebrated Hunter, M'Kenzie, and others, who then shone eminent in the several branches which they taught; and the practice of the different hospitals, particularly that of St. Bartholomew, of which Mr. Pott was senior surgeon, and in the height of reputation. From London he went to France, where he arrived in May, 1751; and obtained the degree of doctor in medicine, from the university of Rheims: he then proceeded to Paris, where he remained

* This eminent physician was born in Philadelphia, and was the son of John Cadwalader and Martha, the aunt of Dr. Jones. After finishing his studies in this country, which were conducted under the father of Dr. Jones, he completed his medical education in Europe, and settled in Philadelphia, where he practised medicine many years, with the most distinguished reputation. Upon the establishment of the Pennsylvania hospital, in the year 1752, he was elected one of its physicians, and was honoured by an annual re-election, until the time of his death, which was more than thirty years after the erection of that institution.

until the month of April in the following year; and attended the anatomical lectures of Mr. Petit, and the practice of the Hotel Dieu, of which well known institution, Messrs. Le Cat, and Le Dran, were then surgeons. He afterwards spent some time at the university of Leyden, and finally visited Edinburgh, which completed his medical tour.

Under masters like these, and enjoying such opportunities, he could not fail, with the assiduity which he employed, of acquiring all the knowledge at that time to be obtained: in consequence of the zeal which he showed in the acquisition of every species of useful knowledge, he attracted the notice of the above celebrated surgeons, which was of essential benefit to him, in the prosecution of his studies: to Mr. Pott, in particular, he considered himself under peculiar obligations, for the marks of friendship he experienced from him, and which could not fail to inspire him with a love of his profession.

During the prosecution of his studies in Europe, Dr. Jones was industrious in collecting all the useful information in his power, especially upon those branches of science more immediately connected with his profession. To anatomy, as the hand-maid of surgery, and the basis of medical science, he paid the greatest attention, but he did not suffer this to engross the whole of his time: convinced of the intimate connection between the different branches of the profession, he considered the separation of them, not only as contrary to nature, but as highly detrimental to the progress of the science; and therefore believed, that a knowledge of one part was indispensably requisite to a right understanding of the other.

Upon the return of Dr. Jones to this country, he settled in New-York; where his abilities soon procured him extensive practice. To the profession of surgery, in particular,

he devoted much attention: he was the first who performed the operation of lithotomy in that city, and succeeded so well in several cases that offered shortly after his return, that his fame, as an operator, became generally known, throughout the middle and eastern states of America. This operation had likewise been frequently attempted in the other states, but the want of success attending it, was generally so great, as to prevent it from being performed in future: the fortunate manner, however, in which those cases under his care succeeded, fully proved, that it was no longer the dangerous operation many had been made to apprehend, and which induced them rather to submit to a miserable life, than suffer the risque of falling a sacrifice to the means instituted for their relief.

About the year 1758, during the existence of a war between France and the then colonies, as a part of the British dominions, a considerable alarm was occasioned by the report of an intended attack of the enemy upon the frontiers of the state; and Dr. Jones, among others, entered as a volunteer surgeon to the troops raised upon the occasion, in which capacity he served with distinguished reputation, until the close of the campaign. It appears, that even the enemies of his country were acquainted with his abilities; for in a severe repulse which they suffered, from the American and British troops under Sir William Johnson, General D'Escaux, commander of the French, was dangerously wounded, and being taken prisoner, immediately placed himself under the care of Dr. Jones; who carefully attended him, for a considerable time, in New-York. At the close of the campaign, he again returned to private practice, with increased reputation. Some years after, upon the establishment of the Philosophical Society of Philadelphia, he was elected one of its first members: he likewise had the honour

to serve it in capacity of curator, in the year 1786, after his removal from the former to the latter city.

Upon the institution of the medical school in the college of New-York, Dr. Jones was appointed professor of surgery ;* upon which branch, he gave several courses of lectures, and thereby diffused a taste for it among the students, and made known the improved modes of practice, lately adopted in Europe, of which most of the practitioners in the country were entirely unacquainted. He likewise endeavoured to instil into the minds of his pupils, the same just principles that guided his conduct, when prosecuting his own studies, and (melancholy experience proving the necessity of the caution) pointed out the necessity of regulating their conduct, as individuals, so as not to detract from their merit as professional men. Viewing the science in an enlarged and honourable light, as comprehending the most extensive view of our nature, and as tending to the alleviation and abridgment of human misery he taught his pupils to despise the servile conduct of those, who consider the profession as worthy of cultivation, only in proportion to the emoluments which it yields ; and to rely upon the solidity of their own endowments, as the best security of general esteem, and for the acquisition of business. He could, with propriety, recommend the pursuit of this conduct to others, having, in his own person, furnished an instance of its success, which deserves to be recorded, as a proof of the triumph of abilities over ignorance and pride.

For a considerable part of the previous life of Dr. Jones,

* It is to be observed, that Dr. Jones was the professor of surgery in King's (now Columbia) college, when his talents were associated with those of Middleton, Clossy, and Dr. Samuel Bard ; a period when the medical school, attached to that institution, held a respectable and envied rank among the literary establishments of our country. ——————*fuit* Ilium——————.

Editors.

he had been afflicted by the asthma, and for a long time had struggled to overcome that painful disease; but the exertions of both his own skill, and of the rest of his medical brethren, in most parts of the continent, had hitherto proved ineffectual towards even his relief. He determined, therefore, to take a voyage to Europe, and accordingly sailed for London. Here, in a thick smoke, and an atmosphere impregnated with every species of animal putrefaction and effluvia, where so many asthmatics have found such remarkable benefit, he also experienced a considerable alleviation of his complaint; and it is not improbable, that the permament alteration in his health which he afterwards enjoyed, may in some measure be attributed to the effects of his residence in London. He also employed himself during his continuance in the metropolis, in collecting subscriptions for a hospital in New-York, which he had been instrumental in establishing, and which, for convenience of structure and accommodation of the patients, was inferior to none in this country: all his trouble however, was of little avail, for shortly after its erection, it was entirely consumed by fire.

In London he again had an opportunity of seeing his friend Mr. Pott, at the head of his profession, and of renewing that attachment which had been previously commenced between them. He had now been for some years left to the guidance of his own judgment, but unlike many who suppose all knowledge to become stationary at the time of their leaving college, he was still willing to be taught by those who had formerly been his instructors, and who, from the greater opportunities they enjoyed, would be enabled to afford him much information. Eager for the acquisition of knowledge, whenever, and wherever it was to be obtained, he again attended the lectures of his old master Dr. Hunter, and those of his friend, Mr. Pott, who lost no opportunity of showing the consistency between his professions and proofs

of respect: during his short stay in London, he paid Dr. Jones the most particular attention, and presented him with a complete copy of his lectures, just before his departure from that city. His kindness however did not end here, for in the frequent applications which he received for advice from all parts of this country, in difficult and important cases, he never failed to recommend his old pupil, as capable of affording any relief to be derived from surgical assistance. In consequence of this, his attendance was frequently desired in the different states; and while he showed by his skill and success, that the opinion which had been formed of him was just, his fame became thereby diffused throughout the continent of America.

The following year he returned to his native country, whose political situation at that time, called loudly for the exertions of all her citizens. He again resumed his lectures, and delivered several courses, and in the autumn of the next year (1775,) published his "*Plain Remarks upon Wounds and Fractures,*"* which he inscribed to his old preceptor, Dr. Cadwalader. Few presents could have been more acceptable to his country, or more opportunely made; for, in the then situation of American affairs, many persons were chosen to act as surgeons, who from their lamentable ignorance of the principles of their profession were but ill qualified for the office; and the performance of Dr. Jones, notwithstanding the publication of more systematic works, will still instruct, and afford valuable information to the student and practitioner of medicine.

The business of teaching, as well as of private practice, was soon after interrupted by the political commotions of his

* A new edition of this work was published in 1795, with memoirs of the life of the author, by Dr James Mease, a gentleman well known for his exertions in the cause of science.—*Ed.*

country. The British army having taken possession of New-York, and the adjacent country becoming the seat of war, Dr. Jones, with all the friends of the American cause, had previously left the city; and retired to some distance into the country. Fully convinced of the danger, with which the liberties of America were threatened, he did not consider it proper to remain a silent spectator of a contest carried on against a country that gave him birth, and to which he was attached by all the ties of veneration and love; he therefore accepted a seat in the senate of New-York, for the southern district, to which he was appointed by the convention chosen for the organization of the state government, in conjunction with other fellow citizens. When he could no longer be useful in his legislative capacity, he exerted his professional abilities, by entering the medical department of the army, where he rendered important services to his suffering fellow soldiers. But this highly satisfactory employment was of a short duration; for the natural delicacy of his constitution, ill comporting with the hardships of a military life, and the manifest injury his health had already received, rendered it necessary for him to return again to private practice. Accordingly, on the evacuation of the city of Philadelphia by the British troops, he went thither in the summer of 1778; and found that during a short stay there, he enjoyed so much freedom from the asthma, with which distressing complaint he had been long afflicted, that he determined to take up his future residence in that city. In the latter end, therefore, of the following year, or beginning of 1780, he removed to Philadelphia. The citizens of that city were not insensible of his merits; for the same success in practice as a professional man, and the same agreeable manners as a gentleman, which placed him so high in the esteem of his fellow-citizens at New-York, could not fail of attracting those of his new place of residence.

On the resignation of Dr. John Redman, as one of the physicians of the Pennsylvania hospital, in the year 1780, Dr. Jones was unanimously elected by the managers to fill the vacancy, and was continued therein, until the time of his death. The same year, he was elected first president of the humane society.

In the year 1787, the physicians of Philadelphia, influenced by the many advantages which have arisen in every country, from well conducted literary institutions, agreed to establish a college among themselves, for the advancement of the interests of medicine in general, but especially in this country; and elected Dr. Jones vice president; the chair of the college having been conferred upon Dr. Redman. To the first part of volume first of the Society's Transactions he communicated one of the most interesting papers, upon Anthrax. To the several offices above mentioned, Dr. Jones was honoured by an annual re-election until the time of his death.

Dr. Jones was not only the intimate friend, but also physician to Dr. Franklin, and attended him in the last illness, which deprived the world and his country of that philosopher. As it may not be unsatisfactory to know something of the manner in which so great a man conducted himself, when about to close his earthly scene and enter upon another, the existence of which he was falsely reported to have disbelieved, "I have preserved" says Dr. Mease, "the following short account of his last illness, drawn up by Dr. Jones, and published at the time:"

"The stone, with which he had been afflicted for several years, had for the last twelve months of his life, confined him chiefly to his bed; and during the extremely painful paroxysms, he was obliged to take large doses of laudanum to mitigate his tortures; still, in the intervals of pain, he not only amused himself by reading and conversing cheerfully

with his family and a few friends who visited him, but was often employed in doing business of a public, as well as of a private nature, with various persons who waited upon him for that purpose; and in every instance, displayed not only the readiness and disposition to do good, which were the distinguishing characteristics of his life, but the fullest, and clearest possession of his uncommon abilities. He also not unfrequently indulged in those *jeux d'esprit*, and entertaining anecdotes, which were the delight of all who heard them.

"About sixteen days before his death, he was seized with a feverish disposition, without any particular symptoms attending it till the third or fourth day, when he complained of a pain in his left breast, which increased till it became extremely acute, attended by a cough and laborious breathing. During this state, when the severity of his pains, drew forth a groan of complaint, he would observe, that he was afraid he did not bear them as he ought; acknowledging his grateful sense of the many blessings he had received from the Supreme being, who had raised him from small and low beginnings, to such high rank and consideration among men: and made no doubt but that his present afflictions were kindly intended to wean him from a world in which he was no longer fit to act the part assigned him. In this frame of body and mind, he continued until five days before his death, when the pain and difficulty of breathing entirely left him, and his family were flattering themselves with the hopes of his recovery; but an imposthume which had formed in his lungs, suddenly burst, and discharged a quantity of matter, which he continued to throw up while he had power, but as that failed, the organs of respiration became gradually oppressed; a calm lethargic state succeeded; and on the 17th instant, (April, 1790) about eleven o'clock at night, he quietly expired, closing a long and useful life of eighty-four years and three months.

"It may not be amiss to add to the above account, that Dr. Franklin, in the year 1735, had a severe pleurisy, which terminated in an abscess of his lungs; and he was then almost suffocated by the quantity and suddenness of the discharge. A second attack, of a similar nature, happened some years after, from which he soon recovered; and did not appear to suffer any inconvenience in his respiration from these diseases."

At this time, when Dr. Jones was reaping the benefits of a long and steady pursuit of his profession, and happy in the possession of the highest confidence of his fellow citizens, death put a stop to his earthly career. In the month of June, 1791, he rode out on horseback, some miles from town, to visit his friend, Mr. Charles Thompson, secretary to congress, during the late war. The day was warm, and he was so fatigued by his excursion, that he did not entirely recover himself for several days. On the evening of the 17th, he paid a visit to the President of the United States; and previously to his return home, from being a very sultry day, the air became remarkably cool. He was dressed in a light manner, suitable to the weather, when he set out; but it was not sufficiently warm for the remarkable and sudden alteration in the temperature of the air that succeeded. Having some patients who required his attendance, he visited them before his return home; where he had no sooner arrived, than he felt himself much indisposed. The next morning he awoke, with considerable fever, attended by a diarrhœa, and great prostration of strength. He continued for four days in this situation, with but little alteration, passing almost sleepless nights. Upon the fifth day, he became considerably better; was able to sit up, and the most flattering prospects were entertained of a quick recovery: exhausted, however, by the violence of the disease, the want of sleep, and the conversation of his numerous friends, who had that day visit-

ed him, he retired early to bed in the evening, with a view, by the help of an anodyne, to procure some rest. This, however, was denied him, and he continued in a very restless and uneasy state the whole night; during which time he had a violent return of his asthma. Early in the morning of the 23d, he felt some inclination to sleep, and desired to be left alone. His orders were, perhaps, too punctually obeyed. At eight o'clock, his servant entered his room, and observed him in a calm slumber; he again visited him two hours after, when he found him in the same position, with his hand under his head, to all appearance, in a profound sleep, but, on approaching the bed, he perceived that he breathed no more. The quiet and easy manner of his death, and the apparent strength of body the preceding day, induced some of his brethren to hope that a suspension of animation only had taken place. The usual means of recovery were accordingly tried for some time, but all in vain; the scene was finally closed. He died in the sixty-third year of his age.

The person of Dr. Jones was about the middle size; his habit was thin, owing to his constant affliction with the asthma; his eye was quick and penetrating; his countenance cheerful, but sedate; and his whole deportment easy and polite.

As a surgeon, Dr. Jones stood at the head of the profession in this country; and he may be deservedly considered, as the chief instrument in effecting the remarkable revolution in that branch of the healing art, which is now so apparent, by laying aside the former complicated modes of practice, and substituting those which are plain and simple. The operation to which he principally confined himself, for many of the last years of his life, was that of lithotomy; and his success in this difficult and important object of a surgeon's duty, was great indeed.

Connected with this part of his professional character,

was his merit as an accoucheur ; and in this difficult and important branch, he was no less successful. During the prosecution of his studies in Europe, he paid particular attention to this subject ; and availed himself of every opportunity to become qualified to practise it, both by a strict attendance upon the various hospitals founded for this particular purpose, and upon the private practice of the different professors. In the lectures which he himself delivered in the college of New-York, he dwelt much upon this subject ; and he may justly be considered, as the first who gave the medical students of this state, a proper and rational notion of the art. Convinced that nature, or more properly speaking, the EXERTIONS of the SYSTEM, were, in the greatest number of instances, sufficient for its own necessities, he seldom had recourse to those artificial aids, by the frequent use of which, the lives of the subjects were formerly so often endangered.

The merit of Dr. Jones, as a physician, was likewise considerable. Though educated in the school of Boerhaave, he never professed an implicit faith in any particular system : he was guided by just general principles, and he varied his practice like every judicious physician, with the varying circumstances of the case. The success of his treatment, was the best proof of the truth of his principles, and of the judgment which directed their application. He lamented the imperfection of the science, and never refused the adoption of any rational means of increasing its certainty, or the use of any remedy, because it was new, which had been sanctioned by experience, and had reason and probability to recommend it : on the other hand, the caution with which he gave way to many much famed antidotes, whose short lived reputation proved their merit, marked him the safe and prudent practitioner.

REVIEW.

ART. I. *The* HISTORY *of* NORTH-CAROLINA. *By* HUGH WILLIAMSON, M. D. LL. D. *Member of the Holland Society of Sciences, of the Society of Arts and Sciences of Utrecht, of the American Philosophical Society, &c.....* Philadelphia. T. Dobson. 8vo. vol. i. pp. 307. vol. ii. pp. 289. 1812.

OF the various departments of literature, to which the attention of American writers has been directed, there is none, we believe, which has been cultivated with so much assiduity and success as that of general history. Historical literature seldom keeps pace with the occurrence of events ; yet such is the industry of our countrymen, and the zeal which they have manifested for this species of knowledge, that they may justly boast of authentic details of most of the principal events connected with the first settlement and colonial history of their country ; of minute and elaborate narratives of the memorable occurrences in their revolution, and of copious accounts of the establishment of their constitution, and of other subsequent events in their annals. These accounts too, are, in not a few instances, furnished by individuals, contemporary with the events they narrate, and who bore a chief part in what they describe.

In the first class, of the authors who have related the circumstances attending our first settlements, may be particularly mentioned Hubbard the journalist, Prince the chronologist, and Cotton Mather the writer of the formidable *Magnalia ;* and our colonial history has been given by Stith, Beverly, Colden, Smith, Hutchinson, Belknap, Trumbull, Wil-

liams, Sullivan, and Minot. The momentous occurrences, which terminated in the establishment of American independence, have been faithfully recorded by Ramsey, Warren, Marshall, and Lee; and if the events subsequent to that period, have not been presented to the public with the same voluminous detail, it may be ascribed rather to their deficiency in popular interest than to any want of disposition in the American people to record them. These names, beside many others that might be added, form a catalogue highly respectable, in point of numbers, though unequal in point of merit.

But to proceed to the volumes before us. The author of the present work claimed our attention on a former occasion, by his interesting publication on the climate of America.* We are happy to renew an acquaintance with one with whom we so agreeably and profitably passed a portion of our time, and from whom we parted with much reluctance. Dr. Williamson has added to the number of our colonial histories; and we have no hesitation to give it as our opinion, that his work is among the most respectable of the kind that has come to our knowledge.

North-Carolina is remarkable as affording, among many other memorable events, a more constant succession of grievances than fell to the lot of any other colony; and it presents throughout, abundant matter for philosophical inquiry and reflection. Yet, notwithstanding this circumstance, if the minute accounts of Hackluyt, Purchas, and some others, be excepted, there seems to have been little attention paid to the progress of its colonization or civil history, since the time in which the first permanent settlements were made in the country. The researches of our author have conse-

* Register, vol. iii. p. 229—240.

quently been the more laborious ; and fortunately, we may add, they have been attended with success. He has derived his information chiefly from original sources ; from public records, the proceedings of the governor's council, the journals of the legislative assembly ; from letter books, and other manuscripts, in the possession of ancient families.

Dr. Williamson commences his undertaking with a short account of the discoveries made in America, by adventurers from the different parts of Europe. He next relates the attempts of Sir Walter Raleigh, to settle a colony in North-Carolina ; and, from that time, the history of North-Carolina is continued down to the beginning of the American revolution. The work closes with a view of the soil, produce, and general state of health in different parts of that country. In the proofs and explanations annexed to each volume, are inserted many valuable documents, selected with care, illustrative of matters contained in the body of the text.

We before remarked, that the materials of Dr. Williamson's history were derived chiefly from original sources ; that they are such as may be depended upon for their correctness, we have the fullest confidence. In the general arrangement of these materials, we find nothing to censure, and much to commend. We have occasionally lamented the want of dates, the more frequent occurrence of which must have been attended with greater advantage. In the selection of his matter, Dr. W. has, with much propriety, enlarged upon events of importance, while those, which are of a trifling nature, are mentioned, without occupying the time of the reader. The information contained in these volumes is communicated in a style remarkable for its uniform plainness, perspicuity, and vigour. The narrative, throughout, affords numerous indications of more than ordinary penetration, into the springs of human action. The author's reflections are the result of a ready and acute mode of think-

ing, divested of undue bias, and are replete with good sense and salutary advice.

We have not time to enter more minutely into an examination of the present work; and our readers will obtain a more accurate idea of its merits from the following extracts, taken from the doctor's excellent view of the climate and diseases of North-Carolina, and his observations on the abuse of ardent spirits. The importance of the subjects must justify the length of our quotations.

"The climate of North-Carolina," says Dr. Williamson, "is usually thought to be unhealthy; but this character is not applicable, except to the eastern part of the state; the part that is best known to strangers, and most frequented, because it is intersected by navigable rivers, and is the general seat of commerce. Other parts of the state are exceedingly healthy. By taking a short view of the face of the country, we shall immediately perceive the cause of this remarkable difference.

"Carolina is a perfect plain for sixty miles from the Atlantic ocean, without hills or stones. It has been covered by water, at no great distance of time. Beds of oyster shells and other marine exuviæ, are found near the surface, in many parts of the flat country. These concretions of shells are burnt for making lime. The gulf stream runs along the coast, within six or seven leagues of the shore. The soundings change suddenly at the edge of the gulf stream, for the margin is nearly a perpendicular bank. A great fissure, nearly in the direction of the northeast and southwest, has been made in the bottom of the ocean, by some convulsion of nature. Such at least appears to have been the case. The ground rose to the northwestward of the chasm, and sunk to the southeastward. The sandy bottom of the sea, by this elevation to the westward, was converted into dry land. In this case, the rivers coming down from the original dry land, made a crooked path for themselves through the sandy plain. Those rivers had little descent; wherefore, in their tardy course, they deposited the vege-

table mould that came down from the higher grounds. In some cases, the sandy plain had been depressed five or six feet below the level of the common surface. In those parts, it must have happened that ponds of stagnant water were formed, until the sunken ground was filled up by vegetable mould. By this hypothesis we are enabled to explain all the present phenomena of the flat country. In some parts we find large sandy tracts, perfectly level, that hardly contain any mixture of clay or vegetable soil. The growth is pine or black jack. In other parts the land is of an excellent quality, with a stiff clay bottom. Those lands are low; and in many places they require draining. The rivers are bordered by a strip of land that is lower than the common surface of the country. Those river lands are exceedingly rich; for they consist of vegetable mould, three or four feet deep, with a small mixture of sand or clay. In many places those river lands are three or four times the breadth of the river. There are other large tracts detached from the rivers in which the soil is nearly of the same quality with that of the river lands. But it is seldom mixed with sand or clay. In those tracts the vegetable soil is commonly five or six feet deep, and the whole of it is saturated with water. Such are the dismals, so called, and the other great swamps that are numerous in the flat country. Supposing as above, that the original surface, where the swamps are found, had been covered for many years with stagnant water, because it was somewhat depressed, it would follow, that the chief rivers at every great fall of rain, must have thrown part of their turbid stream into those stagnant ponds, until they were so filled with adventitious soil, as to produce reeds and other aquatic plants. The luxuriant growth in those swamps, in the progress of time, caused the surface to rise; so that in many cases it is higher than the adjacent sandy and dry plain. Some of those swamps are fifteen or twenty miles in diameter, and they are chiefly covered, at present, with a thick growth of cypress* or juniper.† In some parts they are co-

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* Cupressus disticha, foliis disticis patentibus.

† Cupressus tryoides, foliis imbricatis frondibus ancipitibus.

vered with maple,* poplar,† and white oak,‡ intermixed with tall reeds, magnolia,§ and green briars.

"The soil increases every year by the addition of decayed vegetables; but the water is detained by the leaves and the roots of trees, so as to have little motion, though the surface has become much higher than the water in the adjacent rivers."

"It is conjectured that the swamps, within forty miles of the coast, do not occupy less than a fifth part of the surface. It will readily be perceived, that so large a quantity of stagnant water among putrescent vegetables, must be unfriendly to the health of the inhabitants. Intermitting fevers are very frequent in the summer and autumn; but fevers with inflammatory symptoms, that have a putrid tendency, prevail in the winter. The progress of time and cultivation of the soil, cannot fail to make a considerable change in the climate, in the flat lands of Carolina. And the effects of that change must be favourable to the health of the inhabitants. The natural operations of time would reduce those extensive and numerous swamps, to the condition of firm and dry land; but this event must be greatly accelerated by the progress of cultivation."

"Intermitting fevers are the usual complaints in the eastern part of Carolina. Those fevers seem to arise, as we have already observed, from the exhalations of stagnant water or putrid vegetables. They prevail more or less, according to the quantity of water that is exhaled, impregnated with putrescent vegetables. All our observations tend to confirm this opinion. When stagnant water is not exhaled, intermitting fevers are less prevalent. When putrescent vegetables are exposed to the action of the sun, intermittents are frequent. In the midst of great forests, the sun never visits the surface; his rays being fully intercepted by a thick growth of cypress, juniper, magnolia, and reeds. Intermitting

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* Acer rubrum.

† Arbor tulipifera Virginiana.

‡ Quercus alba Virginiana.

§ Magnolia glauca, foliis oblato oblongis, subtus glaucis.

fevers do not prevail in such places. Families who live in the Dismals, employed in making shingles, without a perch of clear or dry ground, enjoy more health than people who live on their new plantations, near the rivers or swamps. The bad effect of recent cultivation, by which decaying vegetables are exposed to the sun, is severely felt in flat countries and warm climates. Carolina was less sickly before the country was opened. The second colony of adventurers remained twelve months in the country, and they lost only five men out of one hundred and seven, though they were badly sheltered, and suffered much by the scarcity of provisions. A gentleman in Craven county lived on his farm above forty years, without suffering by intermitting fevers, though his family consisted of fifty or sixty persons. There were about one hundred acres of clear ground in front of his house that had been cultivated many years: but there was a thick wood behind the house. In the beginning of the year 1785 he caused all the timber and shrubs that were behind his house, within four or five hundred yards, to be cut down. His object was pasture and a free circulation of air. One third of his family, on the next summer, was taken down by intermitting fevers. Such complaints were not more prevalent than usual, during that summer, in other parts of the flat country. Those fevers were certainly caused by exposing to the sun a large surface of fresh land, covered with putrescent vegetables. Similar effects are very common in the West-Indies, where they are fatal to such a degree, that soil, newly turned up, is supposed by the planters to contain some pestilential quality. Putrid exhalations are the general cause of those bilious intermittents; but in tropical climates, where the sun is vertical, and the tendency to putrefaction great, and where the influence of heat on the living body increases the malignancy of the complaint, those fevers become most fatal. The simple intermitting fever that prevails during the summer season, in Carolina, is seldom fatal to the natives, except in cases where the frequent recurrence of such fevers may occasion an indurated spleen and other visceral obstructions. The consequence of such obstructions is a dropsy or other cachectical complaint, of which the patient dies. Fevers of the warm season

sometimes become dangerous, especially to strangers, by the imprudent conduct of the patient. Upon the approach of febrile symptoms, strangers are apt, as they express themselves, to brave the fever. In this case, by taking exercise, increasing the muscular motion, and not unfrequently by the use of ardent spirits, or other stimulating drinks, they bring on a typhus or other constant fever, instead of a simple intermittent. A warm season, followed by a considerable drought, often produces an endemical flux or dysentery. These complaints are doubtless of the putrid kind, and should be treated accordingly.

"People on the low grounds of Carolina, are frequently attacked by fevers in the winter, which are called inflammatory; for they are attended by pain in some part of the head or breast. These fevers, in many cases, prove fatal in three or four days. By the general symptoms, compared with the circumstances and places in which those fevers prevail, they seem to be of the putrid kind. They prevail in districts that are subject to intermitting fevers; whence they may be presumed to arise, in some measure, from the same cause; but they prevail in a different season of the year; whence it may be inferred, that there is a combination of causes in one fever that does not occur in the other. It has already been observed, that intermitting fevers are more or less frequent in the low lands of Carolina, according to the quantity of putrescent vegetable substance that is exposed to the action of the sun. From this circumstance it is conjectured, that the most simple species of intermitting fevers are, in some measure, the effect of putrefaction; but the most dangerous putrid fevers arise from the same cause. The difference then between the appearance or the effects of those fevers must depend on the state of the solids or the fluids of the person affected, or upon the acrimony or virulence which the putrescent matter may have acquired before it is absorbed. The appearance of those fevers in the summer, when putrescent matter is plentifully diluted by rain, seems to be determined, in some measure, by the constitutions of the several patients. Strangers, from a northern climate, who have a vigorous constitution, whose muscular system is well braced, instead of having a mode-

rate fever, in the summer or autumn, that will duly intermit after the first or second day, in many cases have an ardent fever, with full pulse. Instead of intermitting, it puts on the appearance of a typhus, or a nervous fever, in a few days, and terminates fatally. The same cause should produce the same effect upon similar bodies; but the effects upon the native and stranger are not alike; hence we infer, that a tense fibre or vigorous constitution, which naturally excites more heat, or causes the fever to be more ardent, produces, at the same time, a different and dangerous type. According to this theory, we observe, that by taking violent exercise, when the symptoms of an intermitting fever are coming on, the fever becomes ardent, and in many cases it is attended with danger. From these facts it would appear, that the affecting cause remaining the same, the fever is more or less dangerous according to the constitution of the patient, or any other circumstance that tends more or less to brace the system, or produce symptoms of inflammation.

"Though the fevers that appear in winter, are not usually called intermittents, they are not less affected by putrescent vegetable matter than the autumnal fevers. Those winter fevers have been deemed inflammatory, because, they are usually attended by a pain in the head, or by a pain in the breast, that resembles pleurisy. They prevail not only in the same districts in which intermittents are common, but they are most likely to attack people who, on the preceding autumn, had suffered by intermitting fevers. These circumstances make it probable, but there are other circumstances from which it is certain, that the fevers to which I refer arise from a septic cause. In different years they prevail in different neighbourhoods, affecting one or more persons in every family. When this disease is most prevalent, it may generally be traced to the vicinity of a marsh, or the bed of a river, where mud or other putrescent vegetable substance has been exposed to the sun, in dry weather. The effects of dry weather on similar grounds, in the summer season, are frequently a flux or dysentery, which is also of the putrid kind. If the same cause, that would produce a simple intermittent, may also be found to produce an ardent fever,

tending to putrefaction, by the sole concurrence of muscular motion, or the direct operation of the sun, whereby heat is excited, we are to presume that winter colds would produce remarkable effects on the appearance of that fever. The common effect of cold is to brace the solids and check the perspiration. In the case before us, the perspiration being obstructed, the offending matter, that has been absorbed, is retained in the system, and gives a septic disposition to the fluids, by the increased action of the muscles.* It is generally observed that men suffer more than women or children by this disease. In the months of December and January 1794, 5, eight or nine men, the heads of families, who lived near the river Neus, were taken off by a fever such as I have mentioned; but no other people in that vicinity suffered by the disease. Some cause must have existed for this remarkable difference. The complaints of those men were not produced by intemperance alone; for though ardent spirits injure the system, not only by destroying the powers of the solids, but also by vitiating the fluids, whence they bring on death in various forms, some of the men who fell under that bilious pleurisy, were not intemperate. In this case the disease seems to have arisen from obstructed perspiration. It cannot escape notice that men in Carolina are chiefly exposed to complaints which arise from that source. The temperature of the weather, in the eastern part of the state, is very

* It has been alleged, that the endemic fevers of summer and winter are equally caused by the absorption of putrid matter into the system. In support of this opinion we observe, that being exposed to a heavy shower in summer or autumn, in warm climates, is usually followed by intermitting fevers; but people at sea, in the same latitude and season of the year, expose themselves to showers without danger, because the atmosphere, at sea, is not charged with putrescent exhalations. It may also be observed, that people who use unguents, in warm climates, are less endangered by those fevers. Black people and white people, who have a copious perspiration, are also less subject to those complaints. Cold evenings in the autumn, and rain, by shutting the pores of the skin, are known to be the cause of innumerable fevers. While the perspiration is free, the putrid matter, that may be taken in by the absorbing vessels, is immediately discharged from the system; but in the case of obstructed perspiration, it is retained among the circulating fluids, and becomes the seed of mortal disease. In cold weather, the complaint is usually thrown upon the head or breast.

changeable. When the wind is at northwest, there is occasional hard frost; but the weather, at other times is moderate and soft. As there are not many cold days, nor many days in which flannels or thick woolen garments are necessary, people fit their dress for the temperate weather, and not for the few days of incidental cold. They do not consider that warm clothes may be worn in temperate weather without danger; but thin clothes, in cold weather, expose the wearer to mortal disease. Women and children are not only more temperate than men, but they are usually at home; and they can increase their clothes upon a sudden approach of cold, or they can sit by the fire. Men are frequently surprised by rain or sudden cold, when they are abroad, and are not provided with a suitable dress. Prudence is the child of experience, but heedless men are seldom taught by the experience of other people. Personal experience in this as in many other cases, frequently comes too late. When the planters, they especially who have been visited by intermitting fevers during the summer or autumn, and those who live in the flat country, shall have the prudence to keep themselves dry, and shall be provided, in all their excursions, during the winter, with clothing fitted to cold weather, when they shall exchange the use of grog and ardent spirits for beer well seasoned with hops, or water that is less dangerous than either, we may be assured that many useful lives will be saved to the community.

"When the country shall be sufficiently cleared, and the lands perfectly drained, there is much reason to believe, that people near the seacoast will enjoy a desirable state of health through the latter part of the summer, which is now called the sickly season.* The weather will also be less variable through the winter season, for reasons that have been stated; and a free circulation of air will diminish the summer's heat.

There are not many countries, in which the state of health differs so much as it does at present in the different parts of North Carolina. At the distance of sixty or seventy miles from the coast

* Instances of longevity are not wanting in Carolina in the flat country.

the land begins to rise into small hills, stones appear on the surface, and the streams ripple in their course. As we advance a little further to the westward, we find all the variety of hills and dales that may consist with a fertile country, fit for cultivation. In that happy climate where the soil is good, and the water pure; where the inhabitants enjoy the desirable effects of winter, without suffering by the vigorous severity of cold; there are few of the diseases which are most painful and destructive in cold climates: neither are the inhabitants wasted by the more fatal diseases of warm climates. There are not many parts in the United States, perhaps there is not any part of the world, in which families increase faster than in the western part of Carolina. When we consider, that the inhabitants are seldom affected by coughs, consumptions, or inflammatory complaints, for the winters are temperate, that intermitting, bilious or putrid fevers are seldom found among them; we naturally infer, that the climate must be healthy. It is not denied, that people, in many other climates or countries, are equally healthy with those in the western part of Carolina; but the winters in other regions, that are deemed healthy, are more severe, or the land is less fertile, or it is not so cheap, or the means of supporting a family, from one cause and another, are more difficult than in Carolina; whence it follows, that early marriages are not so frequent, and the increase of families is not so great. We have not the means of comparing the increase of people in Carolina with that in foreign countries, but it has been compared with the increase in other states. It appears by the census taken in the year 1701, that the number of inhabitants above sixteen years old, exceeded the number under sixteen in all the northern and middle states, including Maryland. In the southern states there was a difference in favour of those under sixteen, and this difference was greater in North Carolina than in any other state, except Kentucky. This difference might be explained by supposing that the duration of human life is shorter in the southern states, and that sixteen years is nearer the middle of the general extent; but this solution cannot be admitted, because in the most healthy parts of the southern states the difference was greatest in

favour of the class under sixteen. The greater proportion of people below sixteen must be the combined effect of early marriage and a good climate. Families are easily supported where the lands are good and the winters mild. In this case people marry young, and have many children: but early marriage alone will not produce a great proportion of children when compared to that of grown persons, because sickly climates are not less fatal to infants than to those who are more advanced in years. This distinction is fully supported by the census in North Carolina. The number of males in the whole state, below sixteen, was to that above sixteen, nearly as eleven to ten; but this difference cannot be the effect of early marriage alone, or the facility of maintaining a family; it depends very much on the salubrity of the climate. People live in the district of Edenton with more ease than in the district of Salisbury; for their cattle require less feeding in winter,* and they have a plentiful supply of fish; but the proportion of persons under sixteen, was to that above sixteen, in Salisbury district, compared to that in Edenton district, nearly as three to one. In Salisbury district there were fifteen thousand eight hundred and twenty-six males under sixteen, and thirteen thousand nine hundred and eight above sixteen. The difference is nearly equal to a seventh part of the whole number of the older class. In Edenton district, the number of males under sixteen, was eight thousand six hundred and ninety-six, and the number above sixteen, was eight thousand three hundred and ninety-four: the difference being less than a twenty-seventh part of the number of the older class. This remarkable excess, in favour of Salisbury district, can only be explained by the greater salubrity of the climate. There are some very old people in the western parts of Carolina, but they were not born in that country; they are older than the settlement. After the country shall have been planted two or three centuries, and the natives shall have attained the

* The flat lands near the coast, except such of them as are composed of sand, are generally covered by a thick growth of canes. The leaves of this plant are green all winter. They are long and succulent, and cattle in general are greatly attached to them.

length of years that corresponds with the climate, a greater proportion of the inhabitants above sixteen years will doubtless be found."

The observations of Dr. Williamson, on the abuse of ardent spirits, cannot be too earnestly recommended to the attention of our legislators, magistrates, and fellow citizens in general.

Our author, after giving an account of a dangerous insurrection in North-Carolina, that was quelled in the year 1774, observes, that the leaders and chief agents in the insurrection, were Howel, Hunter, Butler, and Husbands. These men fled from the province, and were outlawed. The person last named, Herman Husbands, settled near Pittsburg, in the western part of Pennsylvania, where, after an interval of twenty-three years, he was believed to have taken an active part in what is called the whiskey insurrection, "One of the most inexcusable riots, (as the historian observes) that ever disgraced a civilized people. A riot, or rebellion, that was countenanced and promoted, to the reproach of learning and talents, and the disgrace of humanity, by men who knew their duty; by men whose sole object was popularity, that they might be elected to honourable employments. It was a riot to prevent a tax upon ardent spirits. A riot for the protection and promotion of drunkenness; that bane of society, that parent of idleness, poverty, and disease. Is it probable, can it be supposed, that the rioters were sober!"

"We cannot observe, (continues Dr. W. in a note to the above paragraph) the increasing thirst, and growing demand for ardent spirits, that appears in every part of the United States, without forming painful anticipations concerning this dangerous appetite.

The experience of the world in former ages is not a rule by which we can estimate the deadly effects of strong drink.

"The process of distillation, and the use of ardent spirits, were altogether unknown to the ancients. In their devotions to the drunken deity, they were confined to the use of wine, or other fermented liquors; but grapes or apples are not the produce of every climate, neither are fermented liquors half so destructive as ardent spirits. They never were the morning cordial, the noon-day beverage, and the evening anodyne. They were the luxury of the rich, but they were not the bane of the multitude. In the present age, some nations are prohibited the use of strong drink, by the precepts of their religion; and people without number, are yet unacquainted with the method of preparing ardent spirits. In Europe and America, the fatal art is fully understood, and the inhabitants claim the privilege of drinking, provided they do not exceed the bounds of moderation. Yes, moderation is the rule by which every man is guided in the use of strong drink. I have seen a man contend for this virtue, who was usually intoxicated seven times in the week. The most habitual sot is not intemperate in his own estimation, for he does not exceed the bounds of his own desires. The vitiated love of strong drink appears to be one of the most common infirmities of human nature. To the savage it is a deadly passion; for he is not restrained by education, or the precepts of morality. The Indians of America, who have cultivated an acquaintance with ardent spirits, have been consumed by it, as grass or straw are consumed by fire. Pestilence and famine, its fellow-labourers in the work of death, are less, far less destructive. Those enemies of our species are universally marked as such. They excite general apprehension of danger, and people fly from the enemy, or they endeavour to guard themselves against him. But strong drink has nothing terrible in its approach. Like a treacherous friend, or insiduous flatterer, it is admitted into all societies, while it is secretly cutting down the weak and the strong. The fabled voice of the syren was not so delusive; the poison of serpents has never been so destructive. What have the white inhabitants of America to expect from a beverage, that has

confessedly destroyed the Indian natives? Our bodies are not formed of different materials. The hope of posterity rests at present on the virtuous pride of the other sex. Our women are not less distinguished by their temperance than by their other virtues; for it is admitted, that women, of the poorest class in society, who were born in America, will not debase themselves by intoxication, as women in like circumstances, in sundry parts of Europe.

"There is not a nation on the face of the earth, nor ever was there a nation, so much endangered by the use of strong drink, as the citizens of the United States of America. As the passion for strong drink is found to be nearly alike among all varieties of men, it must follow that drunkenness will prevail among the multitude in every nation, not restrained by religion, according to the abundance of strong liquor, or the ease with which it may be obtained. But it must be admitted, that strong drink, compared with the price of labour, is cheaper, or it is more easily obtained in the United States, than in any other part of the world. Let us compare the prices in England alone with those in the United States; for it is believed, that no part of the old continent produces more intemperate drinkers than some parts of the British dominions. In London, the price of rum, the duties paid, may be stated at twelve shillings the gallon; Holland gin at twelve shillings and nine pence; Spanish brandy at eleven shillings and nine pence. The average price of those liquors, reduced to our currency, is two hundred and seventy cents per gallon. In the city of New-York, (anno 1801,) West-India rum, the duties paid, may be stated at ninety cents; New-England rum at seventy; Holland gin at one hundred and eighteen; American gin at seventy-five; Spanish brandy at one hundred and ten; and American brandy or whiskey, at sixty cents per gallon. The average price is eighty-nine cents. It follows, that one gallon of ardent spirits in London, costs as much as three gallons in New-York. But the mechanic or day-labourer in New-York, receives double the wages that similar persons receive in London; viz. A journeyman carpenter or mason receives in New-York from one hundred and twenty-five to one hundred and thirty-seven cents the

day: in London, he receives sixty. The day labourer in New-York receives from eighty-eight to one hundred cents the day; in London he receives forty-five cents. That is to say, the price of one day's labour, in New-York, will buy six times the quantity of ardent spirits that it will buy in London. Six to one is a terrible difference. Is it not to be feared, that our fellow-citizens will destroy themselves with ardent spirits, in proportion to the ease with which they may be purchased? Where is the man so inattentive as not to have discovered the increase of drunkenness within the last ten years? For, in that time, the price of labour and the means of obtaining rum have greatly increased. Has the labourer become more wealthy by his increase of wages? Are his wife and children better fed, better clothed, or better instructed? I think they are not. His debts have increased, for his increased wages are expended in rum or brandy, those parents of idleness and vice. In this happy country, where employment of every kind is to be had, and where every man, if he pleases, may cultivate his own soil, there are few instances of extreme poverty that may not be traced to the thirst for strong drink. By a culpable neglect of duty on the part of the civil magistrates; by a contempt of law, and a shameful prostration of morals on the part of small traders, our stores for dry goods in the country, are converted into tippling houses; and our grocery stores are converted into grog-shops, and beggar-makers. Thus it is, that our fellow-citizens are tempted to destroy the energy of body and mind; to sink themselves into idleness, poverty, and death.

"The national legislature, the legislatures of the several states, and the civil magistrates, will answer to their consciences, their country, and their God, for the manner in which they guard the morals, the health, and the lives of their fellow-citizens."

The author originally proposed to bring down the history of North-Carolina to the year 1790, and had actually collected materials for that purpose. We like his work so well, that we cannot but sincerely regret he abandoned his original intention, and hope his days may be continued to complete an undertaking so ably commenced.

ART. II. *The* EMPORIUM *of* ARTS *and* SCIENCES. *Conducted by* JOHN REDMAN COXE, M. D. *Professor of Chemistry in the University of Pennsylvania, &c.* Philadelphia. J. Delaplaine. vol. i. 8vo. pp. 430. 1812.

NOTHING more strikingly characterizes the literature of the present age, than the increased and still increasing number of periodical publications. Those who are acquainted with the progress and present state of science, will readily attribute its more general diffusion and cultivation to the beneficial effects of journals of this kind; and they cannot but be gratified with the present addition to their number, by the Emporium of Dr. Coxe.

Dr. Coxe is already advantageously known as the author of several works on medicine, and as the conductor of the Medical Museum, a periodical journal, formerly published in Philadelphia, for several years. Of his talents and industry, it is therefore unnecessary here to make mention. He is inured to the species of literary labour in which he has at present embarked; and we have no hesitation to say, that the Emporium, executed in the manner proposed, will prove a rich repository of practical information, in the various branches of science, and largely contribute to the general stock of useful knowledge. *Selection* is the principle upon which it is conducted, and its materials are derived chiefly from foreign sources, the periodical journals of England, France, and other parts of Europe. The expense of purchasing these journals, the great uncertainty and delay in their regular transmission, independent of the condition, that in their contents, they are often filled with matters wholly useless and inapplicable to the present condition of our country, have long operated as a barrier to their im-

portation, and circumscribed their usefulness. These circumstances enhance the value and the responsibility of the service undertaken by Professor Coxe.

We quote the following pertinent remarks from the prospectus :

" The Emporium professes to be a source of *practical information in the various branches of scientific research*, and is intended to convey the rich harvest of *facts*, contained in foreign valuable papers on *Chemistry*, *Mineralogy*, *Natural Philosophy*, *Arts*, *Sciences*, and *Agriculture*, with the proper cultivation of which, undoubtedly the truest interests of every country, but especially our own, are closely connected.

" We might expatiate largely on the great utility of such a work, but this would be unnecessary, since our numerous artists and manufacturers will readily perceive that they may derive from it the plainest and easiest means to lessen labour and unnecessary application. In some it will awaken reflection on a favourite pursuit; new sources of industry and emolument will be pointed out to others, and the practical knowledge of many will receive improvement and unexpected aid. Standing, as it were, upon the shoulders of our transatlantic rivals, we may hope to catch new views of the prospect before us, which will enable us to shorten the road to ultimate perfection.

" In this work, Science, which is of no party, will equally distribute her favours to all. It is avowedly a work of practical utility, in which all are equally concerned. Its object is to make that ours, which may subserve both public and private interest. To practical information all other objects are merely secondary; speculative opinions will therefore, as seldom as possible be obtruded.

" A selection will appear in the Emporium, which will render it a kind of *text book* to our citizens, and which, if successfully continued, it is hoped will prove a valuable library of useful knowledge to every class of society.

" Although what has been mentioned will form the prominent features of our publication, it is intended likewise to preserve on

its pages, such insulated facts as may hereafter prove useful. Miscellaneous observations of practical tendency, together with several minor, though not uninteresting subjects of information, will, it is expected, afford a repast to all persons who feel interested in the advancement of science.

"Notwithstanding it is designed principally to attend to the progressive state of science in Europe, from whence we must reasonably look for information for many years to come, yet original papers of our country of real merit, and of practical tendency, will at all times be cheerfully received, and promptly communicated to the public."

We shall only add, that the Emporium, as a specimen of typography, is neatly executed. The engravings with which it is enriched, are honourable to the spirit of the publisher, Mr. Joseph Delaplaine, of Philadelphia.

DOMESTIC INTELLIGENCE.

Case of Epilepsy.

Kortright, Oct. 13, 1812.

Dear Sir,

The following case of epilepsy, with due deference, I transmit to you.

On the 4th day of September, 1811, I was called to the town of Harpersfield, to visit Isabel M'Kee, aged eleven years. During the space of two years, she had been subject to epilepsy, having two and sometimes three fits daily, so that her intellectual faculties were greatly impaired. Nearly three weeks before I was called, at the commencement of a fit, she had fallen into the fire and burnt her left arm, from the elbow to the extremities of her fingers. Little attention was paid to her, until the day I saw her ; when she was lying horizontally on the floor, and frequently threatened with syncope, by means of the loss of about four pounds of blood, the artery of the thumb having ulcerated. I examined the arm, and found the integuments and part of the muscles in a state of sphacelus, but separated from the sound parts, a little below the elbow. I then removed all the morbid parts, secured the artery, by compression, and dressed the sore. I attended her till the cure was completed. From the day she fell into the fire, until the time of the hemorrhagy, she had only two fits, and has been free from epilepsy ever since ; and has fully regained her rational faculties.

From the result of this case, shall it be supposed, that the origin of the disease was in the fore-arm or hand, either in the integuments, or immediately under, and that the disease itself was partially affected by the vesication, and that the

loss of so much blood, by diminishing the repletion, effected the cure? I am apt to think, that the hemorrhagy had no share in the cure, the sphacelus having preceded the hemorrhagy, as the epilepsy partially ceased when the integuments were abraded; and when they became sphacelated there could be no more irritation, and therefore no more aura epileptica. In such cases, after repeated epispastics, without the desired effect, would it not be advisable to scarify the parts, in a contrary direction of the muscles, through the integuments?

I am, dear sir,

Your most obedient humble servant,

HENRY MARSHALL.

DR. DAVID HOSACK.

Inland Navigation of the State of New-York.

Agreeably to promise, we insert in the Register, the interesting and satisfactory Report of the State Commissioners relative to the improvements of the Inland Navigation of New-York, dated March, 1812. By the publication of this Report, we complete all the official documents which have appeared on this important subject.—*Ed.*

THE COMMISSIONERS *appointed in and by an Act to provide for the Improvement of the Internal Navigation of the State, beg leave to Report:*

THAT, in obedience to the directions of the said act, they made application to congress and to the legislatures of the several states and territories, copies of which are annexed in the papers marked No. 1,* and No. 2.† They conceived it proper also, to address

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* Inserted in the Register, vol. ii. p. 449.

† Register, vol. iii. p. 114.

the President of the United States on the subject of their appointment, and annex a copy of their letter to him, No. 3.*

Moreover, considering the magnitude of the object, they deemed it advisable to depute two of their members to the general government, with their letter to the president, and application to the senate and house of representatives. A copy of the report made by that deputation, on the 24th of last month, is also annexed, marked No. 4.† It appears from this report, that although it be uncertain whether the national government will do any thing, it is certain they will do nothing from which immediate aid can be derived. The deputation found itself obliged, by prudential considerations, not only to blend the navigation between Lake Erie and Hudson's river, with objects, some of which are subservient to local interest, but to refrain from asking an advance or even an appropriation of money. The utmost they hoped to obtain was a grant of land; a grant so limited as not to take effect until after the canal should be completed, at the expense of New-York.

It might have been expected that so moderate a request, coupled with the offer that no toll should be taken, would have been immediately granted.

The motives which led to doubt and delay are unknown to the commissioners; and their profound respect for those to whom is committed the conduct of our national affairs, forbids them to hazard a conjecture. But if the offer had been, or should be accepted, still the canal is to be made by the state. So that if the bounty of congress had granted the entreated boon, it would have been merely the purchase, at less than its cost, of a most valuable object, by paying for it a tract of unsaleable land.

The commissioners, in their first report, took the liberty to express the opinion, that an offer of the canal should be made to the national government; and they saw with pleasure and with pride, that the Legislature (concurring in this opinion) adopted the most honourable measures for inducing the United States to acquire it.

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* Register, vol. iii. p. 116.

† Register, vol. ii. p. 451.

But, the offer made and not accepted, the state is at liberty to consult and pursue the maxims of policy. These seem imperatively to demand that the canal be made by her, and for her own account, as soon as circumstances will permit. It is believed that a revenue may be derived from it, far exceeding the interest of what it will cost; and it seems just that those of our citizens who have no immediate interest in the work, should find retribution for their share of the cost (if any) in a revenue which will lessen their future contributions. Whether this subject be considered with a view to commerce and finance, or on the more extensive scale of policy, there would be a want of wisdom, and almost of piety, not to employ for public advantage those means which Divine Providence has placed so completely within our power.

The commissioners have received some replies to the applications they made to the states and territories.

The legislature of Tennessee, on the 16th of November, resolved, that their senators and representatives should be requested to support any laudable attempt made to the congress of the United States, soliciting the aid of the general government in relation to the canal navigation between Hudson's river and the great lakes.

On the 4th of November, the legislature of New-Jersey say, "Although we feel a deep intrest in promoting every attempt to open a communication, by means of canal navigation, between the great lakes and the navigable rivers running through the Atlantic states; and are fully sensible that such communication would tend to enrich, consolidate and strengthen the union; yet as we have not sufficient means for completing the plans of public improvement within this state, already projected, and deemed of the first importance to our immediate prosperity, it would not be advisable, at present, to lend assistance to improvements in other states. And although we anticipate with pleasure, judging from the enlightened policy hitherto pursued in extending public improvements by our national government, that the time is not far distant when, from the rapidly increasing wealth of our country, the vast plans of extending canal navigation will be carried into effect, so as to form a chain of communications from the waters of the Hudson

river to the great lakes, and from the lakes to the Mississippi; yet, as that period has not arrived, we see nothing to warrant us in giving instructions to our representatives in congress, as to the measures they shall pursue, when this subject shall come before them."

The legislature of Connecticut, at a general assembly holden at New-Haven, on the second Thursday of October, resolved, that it was inexpedient to take any measures on the application of the commissioners appointed by the state of New-York for opening a communication by means of a canal navigation between the great lakes and Hudson's river. The reasons assigned by the committee, on whose report the resolution was made, were, that the state could not supply money, and (having elected able men to assist in the councils of the nation) confided national interests to the unbiassed judgment of those whose duty it was to attend to them, and whose means of information are such as to enable them to perform that duty in the best manner.

The legislature of Vermont, on the 30th and 31st October, expressed the opinion that the object was well worthy of consideration; but conceiving the period when they received the communication to be too late to decide on a subject of such importance, they postponed the further consideration to their next session.

On the 29th and 30th of January, the legislature of Massachusetts, with the impartial and dignified wisdom of conscious greatness, resolved unanimously, that the senators of that commonwealth should be instructed, and their representatives requested to use their influence for promoting, by all reasonable encouragement, (in such mode as congress in their wisdom might direct) the opening of a communication, by means of a canal navigation, between the great lakes and Hudson's river: regard being had to the special benefit which would accrue to the state of New-York from the accomplishment of that project.

The legislature of Ohio, also, have (as will be perceived by the message of his excellency the governor) fully approved of the plan.

The commissioners have moreover received a paper signed Reuben Atwater, acting governor of Michigan, A. B. Woodward, J. Witherell, and countersigned Jos. Watson, secretary, which is of the following purport:—"Whereas the commissioners of internal navigation in the state of New-York have addressed to the governor and judges of the Territory of Michigan, certain communications relative to a canal in the state of New-York, which being considered, resolved unanimously, that in the opinion of the undersigned, the canal contemplated by the commissioners of internal navigation in the state of New-York, from Black Rock to Rome, would not be so desirable as a canal round the cataract of Niagara, and another by the Falls of the Oswego. Passed the tenth day of January, one thousand eight hundred and twelve."

The commissioners have too much respect for these gentlemen to suppose they would have given this opinion without information and consideration. Wherefore, they must infer that the information received was not founded in fact; or that, not having habitually turned their attention to objects of this sort, they are not so well qualified to judge, as the consciousness of intelligence respecting matters more familiar to their minds may have led them to suppose. The commissioners, previous to their former report, viewed the country, caused surveys to be made, obtained all the information in their power, listened to the reasons on either side with impartial attention; and although they have not the vanity to oppose their judgment to that of professional men, persist in believing that the conclusions they drew were not unfounded. They feel so much the more confidence in their opinion, as it accords with that of Mr. Weston, whose abilities as an engineer (in this particular department) are unquestioned. To that gentleman their report was transmitted by one of his friends; and in reply (after treating of the means to obtain sufficient water at the summit level of Rome) he says, "supposing your fears on this subject to be removed, you have no further obstacles to encounter, in your progress westward, until you arrive at Oswego falls. From thence to Oswego is the great work. I know not whether I ever declared that it was *impossible* to conduct a canal by this route; I should

rather think it was the technical term *impracticable*, of course restricted in the sense mentioned in the report; and under those limitations, I still deem it so; and such I am persuaded it will be declared by every *practical* professional man. But supposing your wishes accomplished, the question then occurs, would the trade of the lakes be directed into this channel, from its natural one down the St. Lawrence. On the superior facilities afforded by this river, for the transportation of produce, I perfectly agree with the commissioners, having traversed it twice between Kingston and Montreal, and each time viewed it very attentively. I can therefore assert with confidence, that I know of no existing navigation, of such extent, which can be rendered perfect at so small an expense. However, should your noble plan, of uniting Lake Erie with the Hudson, be carried into effect, you have to fear no rivalry. The commerce of the enormous extent of country bordering on the upper lakes, is yours forever; and to such an incalculable amount as would baffle all conjecture to conceive."

If the Michigan gentlemen were alone in their opinion, it might be useless to say any thing, seeing there is little probability that any contribution will be required from them. But there are, it is said, men of influential character who preach the same doctrine. To this effect they assume, what remains to be proved, not only that lock navigation by the falls of Oswego and cataract of Niagara is practicable, but that it is both cheaper and better than a canal direct from the Niagara to the Hudson river. On the practicability it would be superfluous to add a remark, for those who believe they can, from a cursory view, or no view at all, judge better than such men as Mr. Weston, after critical examination of the ground, will hardly expect to obtain the confidence of others, however great their reliance on themselves. Nevertheless, these gentlemen are entreated seriously to consider whether it be prudent, or even honest, to hazard misleading those who think well of them, and thereby involving the state in great and fruitless expense. And this must be the consequence of undertaking the work they recommend. That the cost will be great is certified by all who possess competent judgment and information.

That it will be fruitless, may be proved by facts visible to every one, who chooses to open his eyes. In the gazettes of this city are advertised the rates at which goods will be carried from the ports of lake Ontario, to Ogdensburgh, and thence to Montreal. The first are lower than have heretofore prevailed between Lewistown and Oswego. The second are fifty-five cents in scows, and eighty-eight cents in boats, for a barrel of flour. But to ascend Oswego river by locks, and then, after crossing Oneida lake, to ascend Wood creek in boats, which, for great part of the way, must be rowed by men, would, it is believed, cost not less than fifty cents per barrel; because, if three men bring up thirty barrels in five days, at fifty cents per barrel, they would earn only one dollar per day each; allowing for toll nothing, for delay while waiting for freight nothing, for wear and tear of the boat nothing, and nothing for the return empty, if no freight should offer.

Thus it seems probable that produce could not be taken from Oswego to Rome, for less than from Ogdensburgh to Montreal; so that the communication which professional men, after due examination, consider as impracticable, unless at an enormous expense, wholly disproportionate to the object, but which some gentlemen assume, without examination, to be very simple, would, if completed, be of no avail. Instead of drawing to us the trade of our neighbours, it would turn much of our trade to them. Farmers who cannot send their produce by land, from beyond Geneva to Albany, must carry it to one of the few bad harbours on Lake Ontario, thence to wait the arrival of schooners from Ogdensburgh. But, it is certain, even if a commerce with those vast regions which surround the great lakes, be put out of the question, that the inhabitants of our western counties must be greatly benefitted by a navigable canal, dug at a distance from Lake Ontario. Let the mind be turned to a tract of country, fifty miles wide, and stretched out east and west on the south side of that lake. It cannot be denied that, if good harbours were abundant on its shores, and if the adjacent country offered good roads, the average distance of land carriage must be at least twenty-five miles. But, inasmuch as the harbours are few, it must be sixty or seventy

from many parts of the tract. Under these circumstances, let it be supposed that a canal should be run east and west through the middle. As that would be accessible in every part, it is evident that the extreme distance of land carriage would be less than the mean distance at present. The conclusion is so clear, that to say more would not show proper respect to the wisdom of the legislature. There is another part of the subject, however, which stands in close connexion with what has just been advanced, and which, coming in support of Mr. Weston's opinion on the effect of the canal in securing to this state the commerce of the western world, it would be unjust to withhold.

The commissioners pray leave, then, to revert to and develop the basis of a calculation stated in their first report. Two horses can, in still water, draw a boat laden with fifty tons at the rate of two miles and a half in an hour, wherefore the progress in eight hours will be twenty miles. This, then, is the smallest distance which can reasonably be expected in one day. Now, as three men will be required to manage and steer a boat, the daily allowance of five dollars may be made for men and horses, being one dollar each; and that is surely enough. But a further allowance must be made for use of the boat, profit of the owner, and time unavoidably lost. It may be well to appropriate to these objects all the return freight, and charge the whole expense, to and fro, on what may be called the export cargo. This will, of course, double the amount, and bring it to ten dollars for twenty miles, or fifty cents per mile. Wherefore the extent of what it can cost to transport fifty tons one mile, on a canal, being fifty cents, the rate is one cent per ton per mile. To this, perhaps, it will be objected, that experience in this state does by no means justify so low an estimate. But there is no such experience, for there is no canal navigation in the state: and the commissioners have already, in their first report, stated the objections to following rivers, creeks, brooks and torrents, by the main strength of men, instead of drawing boats by horses along the tranquil surface of a canal.

Let it be supposed that the windings of a canal will so far exceed those of the present road, as that the length from lake Erie

to Hudson's river shall be three hundred and fifty miles; consequently that the transportation of a ton will cost three hundred and fifty cents. To this let two hundred and fifty more be added, for toll, the amount will then be six hundred cents per ton; and taking ten barrels of flour to a ton, the transportation of each barrel will cost sixty cents. If to this twenty cents be added for freight to New-York, the total will be but eighty cents, from the port of discharge on lake Erie, to the commercial emporium of New-York, and the risque of this route is so trifling as not to merit notice. By the advertisement already alluded to, it appears that the lowest price of freight (and for part of the way in hazardous craft) is ninety-three cents per barrel of flour, from Lewistown to Montreal. Instead of adding for insurance, let something be taken away, and let it be supposed that hereafter both freight and insurance shall cost but ninety cents, even then nine barrels of flour will be taken from above the falls of Niagara to New-York, for the same price that eight can be taken now from below those falls to Montreal. The expense of passing from Lake Erie to Lake Ontario must be added. And here, let it be asked, what kind of locks are those which gentlemen project round the cataract of Niagara. Every expense which may be needful to facilitate the navigation through the rapid at Black Rock must be encountered, in the one case as in the other. But when a large vessel, from Lake Erie, shall have brought her cargo to within a small distance of the cataract, it would be ridiculous to put it on board of small boats merely to descend by locks, to Lake Ontario, and then put it again on board of large vessels to cross that lake. It would be equally ridiculous to attempt the transportation, on either lake, in small boats. The locks, then, to be of use, must be such as will take up and let down vessels which navigate the lakes. These then are the locks which the state is desired to make, in the expectation that after a vessel from the upper lakes shall have descended into Ontario, she will stop at the difficult and dangerous port of Oswego, instead of going on easily and safely to Ogdensburgh. The inventors and abettors of this project may have the best and most patriotic intentions, but their scheme,

if carried into effect, would increase (by the resources of New-York) the wealth of Canada and the power of Great-Britain. Before this subject be dismissed, it may not be improper to compare the expense of transportation on a canal with that on a turnpike road. The cost of carriage from Albany to Utica, by land, is seventy-five cents per hundred, or fifteen dollars per ton. Were the distance one hundred miles, (which it is not) one fifth of it, or twenty miles, would cost three dollars, and forty miles would cost six. The proposed canal will, then, to every useful purpose, produce the same effect as if Lake Erie were brought within forty miles of Hudson's river. In other words, the great lakes, those inland seas, admitting of a navigation with vessels of the largest burthen, and girt by shores exceeding two thousand miles, would be connected with the Atlantic by a portage of only forty miles. The country between Hudson's river and lake Erie, within twenty miles of the canal, a country whose natural advantages are not surpassed by any other of equal extent on the globe, would thus be virtually condensed within a space whose medium distance from the tide waters of the ocean would be but thirty miles. Hence the most important consequences to the prosperity of our country would be produced. Among these, as an item worth millions, may be reckoned the saving of those articles which would otherwise not be produced, or would be suffered to perish from the impracticability of bringing them to market.

It is impossible to ascertain, and is difficult to imagine, how much toll would be collected. The amount of transportation might be estimated by subjecting probabilities to calculation. But, like our advance in numbers and wealth, calculation outruns fancy. Things which twenty years ago a man would have been laughed at for believing, we now see. At that time, the most ardent mind, proceeding on established facts by the unerring rules of arithmetic, was obliged to drop the pen at results which imagination could not embrace. Under circumstances of this sort, there can be no doubt that those microcosmic minds which, habitually occupied in the consideration of what is little, are incapable of discerning what is great, and who already stigmatize the proposed ca-

nal as a romantic scheme; will, not unsparingly, distribute the epithets, absurd, ridiculous, chimerical, on the estimate of what it may produce. The commissioners must, nevertheless, have the hardihood to brave the sneers and sarcasms of men, who, with too much pride to study, and too much wit to think, undervalue what they do not understand, and condemn what they cannot comprehend.

Wise legislators will examine and reason upon facts. Viewing the extent and fertility of the country with which this canal is to open a communication, it is not extravagant to suppose that, when settled, its produce will equal the present export of the Atlantic states; because it contains more land, and that land of a superior quality.

Those who contemplate the rapid increase of population, especially in that quarter, must be convinced the period is not remote when those regions will be cultivated. Indeed, they already embrace an extensive tract, which has been subdued by the arm of industry. The amount of articles transported on the canal which will be consumed at home, must, if circumstances should preserve, here, the proportions usual in similar cases, exceed that part of them which is sent abroad. Nevertheless, without extending our view to the commerce of other ports, it is sufficient to take the simple facts, that upwards of 250,000 tons of shipping belong to this state, and that the value of domestic produce exported is upwards of ten million dollars. Now 250,000 tons of goods, at 40 dollars per ton, make up that sum; and grain, at 40 dollars per ton, will not average less than one dollar per bushel. Many of the exported articles are, unquestionably, more valuable, but some are less valuable than grain. Is it then an extravagance to suppose, that the present export of domestic produce is not far short of 250,000 tons; and that it will be doubled by means of the canal? But lest this assumption should be a ground of cavil, let every article of domestic consumption be added. Will it then appear improbable that, twenty years hence, the canal should annually bring down 250,000 tons? It has already been assumed, that a toll of 250 cents per ton should be taken; which, on boats going

and returning, will give five dollars per ton, and yield, therefore, one million two hundred and fifty thousand dollars. If this sum be too great, let one fifth be struck off for expenses and diminution of toll on bulky articles of little value. A million remains. Is that million too much, take away four hundred thousand: still there will remain six hundred thousand dollars, the interest, at six per cent. of ten million. Should the canal, therefore, cost even that large sum, it will soon pay the interest, and very soon afterwards, by natural and necessary increase, discharge the principal. Standing on such facts, is it extravagant to believe that New-York may look forward to the receipt (at no distant period) of one million dollars net revenue from this canal? The life of an individual is short. The time is not distant when those who make this report will have passed away. But no term is fixed to the existence of a state; and the first wish of a patriot's heart is that his own may be immortal. But whatever limit may have been assigned to the duration of New-York, by those eternal decrees which established the heavens and the earth, it is hardly to be expected that she will be blotted from the list of political societies before the effects here stated shall have been sensibly felt. And even when, by the flow of that perpetual stream which bears all human institutions away, our constitution shall be dissolved, and our laws be lost, still the descendants of our children's children will remain. The same mountains will stand, the same rivers run. New moral combinations will be formed on the old physical foundations, and the extended line of remote prosperity, after a lapse of two thousand years, and the ravage of repeated revolutions, when the records of history shall have been obliterated, and the tongue of tradition have converted (as in China) the shadowy remembrance of ancient events into childish tales of miracles, this national work shall remain. It shall bear testimony to the genius, the learning, the industry and intelligence of the present age.

The commissioners will not, as they might, dwell on the advantages which the commerce of the state must derive from opening a scene so vast to its incessant activity. Neither will they hint at the political influence which must result from holding a key to the

commerce of our western world. This subject, too delicate for discussion, is appropriate to the high consideration of legislative intelligence, and should not, by subordinate agents, be approached but with prudential respect.

The commissioners beg leave to advert to a question which comes more properly within their sphere. What will this canal cost? An important question, but one to which they cannot give a satisfactory answer. They have taken pains to extend investigation, increased the number of surveys, and accumulated the knowledge of facts. In proportion to the information acquired is their conviction, that the plan is practicable, and that the probable expense, compared with the advantage, is moderate, very moderate; for they persist in believing, that it may be accomplished for five or six million of dollars. But they have neither the needful information on which to calculate, nor have they the professional ability. Mr. Weston, an engineer of great and acknowledged talents and experience, who has already been employed in that capacity, both in this state and in Pennsylvania, (in the letter, a part of which has already been cited) says,

"From the perspicuous topographical description, and neat plan and profile of the route of the contemplated canal, I entertain little doubt of the practicability of the measure. Perhaps this is the only question which the legislature should be particularly anxious to have resolved. The expense, be it what it may, is no object when compared with the incalculable benefit; though doubtless it will deserve attention that the money granted be wisely and economically expended. As the survey already made is only what is technically called a running level, much allowance ought to be made with respect to eligibility of the route, and amount of descent. Indeed, to determine the proper line of canal will require the utmost skill of the professional engineer. Its due performance is of vital importance. A small mistake therein, from whatever cause arising, may occasion the needless waste of thousands. Too much care cannot be taken, in the first instance, in exploring the country in every practicable direction, that the final decision may be founded on the result of a comparison of the different routes,

as combining shortness of distance with cheapness of execution. The extraordinary regularity in the third or western division, induces me to concur, without hesitation, in the plan recommended by the commissioners, of cutting the canal with an uniform descent, in preference to the usual mode of carrying it on a level. It is true that the latter custom has, almost invariably, been adopted in Europe, but the inducements thereto have generally been the scanty supply of water on the respective summits, the shortness of the different levels, and the tolerably equal amount of tonnage conveyed in opposite directions. None of these circumstances occur in the instance before us, for the supply of water, as is justly observed, is pure and inexhaustible. The length of line from the mouth of the Tonewanta to Cayuga river, is upwards of one hundred and twenty miles; an extent of canal without lockage, unequalled by any now in existence; and the chief amount of tonnage will be always downwards. For these reasons I strongly recommend the adoption of the plan."

Without taking up those hypothetical suggestions which present themselves, on such an occasion, to one whose experience of difficulties, whose knowledge of means, and whose intellectual resources lead to the notice of things which escape common observation, it is evident that the commissioners would be unpardonably presumptuous should they pretend to accuracy of calculation, before sufficient materials are collected to decide the judgment of a professional man, such as Mr. Weston. In speaking of what they hazarded in their first report, he says, "the allowance of twelve and a half cents per yard, for common cutting, is ample, but the estimate of the average quantity of earth to be excavated is underrated." He thinks, too, that the obstructions arising from trees and roots, are greater than was apprehended. The estimate of one thousand dollars per foot, for lockage, is, he says, sufficient, but two dollars per cubic yard, for such masonry as would be required for aqueducts, is too low; and he says, that the expense of double locks, though great, will not, as was supposed, be increased in a two fold ratio. The commissioners perceived that an error had been made in

their first report, respecting the cost of an embankment over the outlet of the Cayuga lake; but there is no need of correcting it; because, from the surveys of last season, it appears that the ground between that and the Seneca lake, is too low for so high a level. Unless, therefore, a more favourable route can be discovered, the course by an inclined plane cannot be pursued throughout, and it may become necessary to descend eighty or ninety feet, so as to cross the outlet of the Cayuga by an embankment of moderate height. In this case, the communication from lake Erie will consist—1st. Of an inclined plane to the Seneca outlet: 2d. Of a descent by locks to a lower line: 3d. Of a level canal as far east as the face of the country may indicate: 4th. Of an elevation, at the end of it, by locks, to the Rome summit: 5th. Of a level canal from thence to where descent may become needful: And 6th. Of an inclined plane from that place to a bason near the Hudson river. In the course of so vast a work, much must depend on the nature of the soil; and it may sometimes be cheaper to obtain that which is good, by extending the distance, than to cure natural defects on a more direct course. It may, in some cases, also be advisable to avoid deep cutting, by a circuit, and in others, to cut deep for a shorter line. It is evident that the commissioners cannot make a correct estimate. It is nevertheless their duty to present the best which their information and abilities will permit, taking care that their allowance be rather too high than too low. They assume, then, that the distance may, for the reasons assigned, be lengthened to three hundred and fifty, instead of three hundred miles; or that, to avoid the additional distance, an expense equivalent to it may be encountered. They moreover take the quantity to be excavated, at twice what was mentioned in their first report, viz. at thirty cubic yards, instead of fifteen, and, (to embrace the various contingencies which may occur,) assume the cost of digging, at near twenty cents per cubic yard, instead of twelve and an half, which Mr. Weston, (who founds his opinion on experience acquired by conducting such works, in this country,) considers as amply sufficient for common cutting. This will give ten thousand dollars for every mile; a smaller sum than has

been expended by private companies in the United States on some turnpike roads; but fully sufficient, it is believed, to cover any expense which can attend that part of the business.

Thus the cutting of the canal would cost three millions and an half. A descent, by double locks, of eighty or ninety feet, and the consequent ascent to regain a proper level, may be put, in round numbers, at half a million more. Together, four millions. The embankment over the Cayuga outlet, with the needful culverts, may cost three or four hundred thousand, but say half a million, and set the excavation at the Tonewanta at three hundred thousand; the aqueduct over the Genesee, with many smaller aqueducts and culverts, at two hundred thousand; making another million: to which one more may be added, for works at Black Rock rapid, a bason near the Hudson; and those contingencies which necessarily attend an undertaking of such magnitude: in the whole, six million dollars. The commissioners may be mistaken, but they have no reason to believe it will cost so much.

They hasten to the examination of two other points: Has the state sufficient resources? Ought the business to be undertaken now, or postponed to a future day? On the resources of the state they would speak with caution, did the sum bear an important proportion to her wealth. But it is almost a contradiction in terms to suppose, that an expenditure of five or six million, in ten or a dozen years, can be a serious consideration to a million men enjoying one of the richest soils and finest climates under heaven. When, in addition to these leading facts, it is considered that there is scarcely a spot on the globe which possesses such advantages for commerce, and that the number of inhabitants doubles in twenty years; the facility of encountering the object proposed by immediate taxation, is one of those evident propositions which argument may rather obscure than elucidate. If the facility of bearing such a trifling weight required it, proof the most full and complete might be found in every gazette. It will not be pretended that the national revenue (raised by indirect tax on the consumption of less than six million of souls) was oppressive, though it exceeded twelve million of dollars. No man has been galled by,

none has felt that burthen, which amounts (nevertheless) to two dollars a head. The share paid by this state, therefore, supposing our average consumption to be the same as that of our neighbours, is two million: four times what would be required to make, in ten or a dozen years, the projected canal. Or let the subject be examined in another point of view. The increase of wealth, in this state, has been (and for evident reasons must be) much more rapid than the increase of inhabitants. The value of property is at least quadrupled in the period during which population is doubled. The present amount of property has been estimated at five hundred million. Perhaps it is more. But should it be much less, time will soon bring it up to, and immediately push it beyond that sum; which may therefore be taken as the standard. Of consequence it follows, that an annual tax of half a million would be but one tenth per cent on the value of real and personal estate. Take the matter again in another point of view, and, admitting that the rich pay the portion of tax that would fall on the poor in a distribution by poll, which (let the tax be laid as it may) must happen, the average contribution will be that of a family in medium circumstances. Wherefore, as a population of one million embraces two hundred thousand families, the average contribution, to raise a revenue of five hundred thousand dollars, would be five dollars from two families. Half of that, or two hundred and fifty cents, is, then, the sum which the head of a family in easy circumstances would be called on to pay, if money were raised by direct tax to carry on the work. In that case, there can be no doubt that a wise legislature would open sources from which adequate revenue could be drawn, not only without injury, but even with advantage to the community. But of this there is no necessity. The credit of this state is sufficient. And if a calculation were made on principles of compound interest, it would appear that the sum to be expended, with interest, until the canal shall yield sufficient revenue, will not exceed what that income would discharge in a reasonable time. If therefore the legislature say, let it be done—it will be done.

But shall they say so now? Shall it be done now, or shall it be postponed to a future day? Those who wish to postpone are respectfully asked, whether they suppose time will render the matter easier? Will it alter the shape of the country? Will the land to be used for the canal cost less when it shall be planted as an orchard, tilled as a garden, or covered by a house, than in its present condition? Will timber and lime be cheaper when wood, now worth nothing, shall have grown dear? Is it certain that the state of public affairs will be as favourable then as now? Will not a fertile imagination invent as good reasons for postponement then as now? And to what day shall it be postponed? Must it be to the day when a legislature shall have *that* patriotism which the idea of postponement pre-supposes the present legislature to want? The commissioners reply with pain to arguments which imply insult. Who is there so base as not to repel the charge of selfishness? What man so cold as not to feel the dignified desire of immortalizing his name, by contributing to a monument of national magnificence, unequalled by any thing on earth?

A state, in its corporate capacity, is an invisible, intellectual existence. If that to which we belong could be reduced to personal identification, could it become an individual, or (that being impossible) could we suppose an individual to be owner of the state, what should we think of his understanding did he hesitate to double the value of his property, and increase his revenue three-fold, without labour, without expense! Yet such is the present case, unless it can be called an expense to run in debt for an object which will pay both principal and interest before the debt falls due. Or suppose this individual to be an infant, would his guardians do their duty should they let slip the golden opportunity so to promote the interest of their ward? But the legislature is guardian of the state.

The foregoing reflections lead to one of the duties enjoined on the commissioners. They were directed to apply to the proprietors of land through which the canal may be carried, for cessions to the people of this state. Such applications have been made, and they have no doubt that the proprietors will contribute in just

measure. Some grants would have been already made, but for difficulties in the form originally proposed, and from a desire that they should be proportionate to the tracts the grantors respectively hold.

The commissioners have also in execution of the duties imposed by the act, endeavoured to ascertain whether loans for the object of it can be obtained on the credit of this state. They find that, notwithstanding the scarcity of money consequent on the war which has so long raged in and ravaged Europe, a loan of five million dollars can be obtained, *there*, on the credit of the state, for a term of ten or fifteen years, at an annual interest of six per cent.

The commissioners have inquired the terms on which the western inland lock navigation company will surrender their rights. They ask one hundred and ninety thousand dollars for the shares held by them, exclusive of three hundred and fifty shares held by the state. This being thought too much, they were urged to confine their demand within such moderate bounds as might be acceptable. Copy of their reply, of the 13th February, is in the paper marked No. 5,* hereunto annexed.

The commissioners have, in obedience to the directions of the act, sought for, and will employ a capable engineer as soon as a suitable character can be procured. None but a man of the first rate talents, tried integrity, and approved experience, can be relied on for that previous investigation which is indispensable. In the mean time, they have employed surveyors to continue their search of the best probable route.

It was not within the circle of their duty to ascertain the conveniences presented by nature for an internal navigation northward; wherefore, although there can be no doubt that an examination of the country, with that view, might be useful, they forbore the attempt. In that quarter lies a large and fertile territory peculiarly our own—moreover, it will be seen by the bill annexed to the report of the deputation sent to Washington, that a communication, by means of a canal, between lake Champlain and Hud-

* See Register, vol. iii. p. 378.

son's river, is one of those things which are deemed of national importance. It would certainly tend to preserve brotherly affection in the great American family; and the reciprocal advantages which it would procure to New-York and Vermont, would strengthen the bands of our union with the eastern states, so conducive to our mutual prosperity.

All which is humbly submitted.

GOUV. MORRIS,
S. V. RENSSELAER,
DE WITT CLINTON,
SIMEON DE WITT,
W. NORTH,
THOMAS EDDY,
ROB. R. LIVINGSTON.

Albany, March, 1812.

Copy of a Letter of 13*th February*, 1812, *from Robert Bowne, to the Commissioners.*

New-York, 2*d Mo.* 13*th*, 1812.

RESPECTED FRIENDS,

Your letter, of the 24th of August, has been duly considered by the board of directors of the Western Inland Lock Navigation Company; and they have directed me to say, that they cannot, in justice to the stockholders, deviate from the terms before communicated to the commissioners. The company was originally formed in consequence of an act of incorporation, not asked for by themselves. The legislature conceived, very justly, that it would promote the general interest of the state, if an improvement should be made in the Mohawk river, and encouraged the citizens to unite in the undertaking. It may very truly be observed, that most of the stockholders subscribed more from patriotic, than from pecuniary motives, and the result has been, that the state has been greatly benefitted, and the stockholders have received no advantage.

The monies expended, amount to near four hundred and fifty thousand dollars, and less than half that sum is now only demand-

ed. This sacrifice is made on account of the sincere desire the directors feel in promoting a further and more extensive improvement of the Western Inland Navigation, and they presume the commissioners will be satisfied that their present demand is just and reasonable.

I am, with due respect, yours, &c.

ROB. BOWNE, *Pres't.*

To De Witt Clinton and R. Fulton, Esquires.

New-York Free School Society.

THE city of New-York has long been particularly distinguished above every other city of the union, for the number and excellence of its humane and charitable institutions. The New-York Hospital, Lying-in Hospital, New-York Alms-House, Humane Society, New-York Free Schools, City Dispensary, and the Manumission Society, though among the principal, are but a part of the establishments devoted to the liberal purposes of humanity, and which do honour to the munificence and character of its inhabitants. An historical account of the origin, progress, and present condition of these societies, and of others of a like kind in our country, has been long desired. It would afford much matter for reflection, and could not fail to contribute to their usefulness, inasmuch as their numerous beneficial effects would become more generally known and appreciated. At this time, we propose to give a short account of the New-Yoak Free School Society.

Many laudable institutions, devoted to the charitable purpose of educating the children of the poor, whose parents belong to particular denominations of christians, have been long established in the city of New-York. But the poor of

those denominations who were not provided with establishments of this kind, and those of that class of the community whose parents were the members of no religious society whatever, were, in general, precluded the benefits of gratuitous instruction, until the organization of the New-York Free School, in 1805. In April of that year, agreeably to an application made to the state legislature, an act was passed to incorporate "the society instituted in the city of New-York, for the establishment of a Free School for the education of poor children, who do not belong to, or are not provided for by any religious society." On the first Monday of the ensuing May, a board of trustees of thirteen members was elected, who immediately entered upon the duties assigned them. A plan of education was now to be devised, which should effectually secure the several objects contemplated by the society in their act of incorporation. The justly celebrated system of JOSEPH LANCASTER, which, in England, has already been adopted with the greatest advantage, appeared to the trustees, after due deliberation, to be the best calculated for this purpose; and on the 6th of May, 1806, a school, provided with an able teacher, was opened in Bancker-street. This was the first institution, after the Lancasterian plan, established in the United States.

To enable the society to proceed in their laudable design, a public subscription was opened by the mayor* of New-York, with his characteristic liberality, and by the bounty of the inhabitants of this city, five thousand six hundred and forty-eight dollars were collected. The legislature of the state of New-York, on the ensuing February, appropriated four thousand dollars for the "purpose of erecting a suitable

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* Dewitt Clinton, Esq.

building or buildings, for the instruction of poor children, and every year thereafter, the sum of one thousand dollars, for the purpose of promoting the benevolent objects of the society." The corporation of the city, also, finding the tenement in Bancker-street, inadequate to the accommodation of the society, appropriated a building adjacent to the alms-house, for its immediate convenience, and the sum of five hundred dollars towards putting it in repair, on condition that the society educate fifty children from the number of poor in the alms-house.

In December, 1809, this establishment, after having remained in the last mentioned place more than eighteen months, was removed to the elegant and spacious building which it now occupies, in Chatham-street. This building was originally a public arsenal; but by means of the liberality of the corporation, who, upon condition that the institution educate the poor of the alms-house, granted the ground upon which it stands and the sum of fifteen hundred dollars to aid in its alteration, the society was enabled to new model the whole, and put it in its present excellent condition. The upper room, appropriated to the use of the school, is sufficiently large to accommodate six hundred pupils; and on the ground floor, there are convenient apartments for the family of the teacher, for the meeting of the trustees, and for a female school of about one hundred pupils.*

Beside the above establishment, denominated Free School No. 1, the society laid the foundation for a second building, in November, 1810, in Henry-street, on ground liberally granted for that purpose, by Col. H. Rutgers. This build-

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*For the late improvements which decorate the elevation of this building, and the conveniences afforded by its internal arrangement, the public is indebted to John R. Murray, Esq. of this city.

ing, called Free School No. 2, was completed in the ensuing year, and opened in November, 1811.

According to the last annual report of the society, published in May, 1812, the school-room, in Chatham-street, contained four hundred and fifty scholars, male and female, in reading, writing, and arithmetic; while the school in Henry-street afforded instruction to three hundred boys and girls, employed in the same branches of learning, after the Lancasterian method. The benefits which will result to the community from an establishment, by which we may shortly expect, at least, one thousand helpless children annually instructed in the principles of morality, and in the elements of useful knowledge, are too obvious to need mention. The enlightened and public spirited founders richly merit the esteem of every friend to humanity. With much pleasure we add, that many institutions of a similar kind have been established in other parts of the United States, upon the plan of the Lancasterian Free School of New-York. For further particulars on this subject, the reader is referred to the excellent address delivered in December, in 1809, by the president of the society, the Hon. Dewitt Clinton.

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American Antiquarian Society.

This society was incorporated by an act of the legislature of the commonwealth of Massachusetts, passed October 22, 1812. Its object is to collect and preserve the most authentic ancient documents and memorials, and to excite new investigations and researches of learned and ingenious men, upon whatever relates to the tribes, manners, &c. of the aborigines of America, and the subsequent discovery and history of the country.

The first meeting was held at the Exchange Coffee-House in Boston, on Thursday, the 19th of November last, when the following officers were chosen:

Isaiah Thomas, Esq. President; William Dandridge Peck, (Professor of Botany and Natural Philosophy in the University of Cambridge,) Vice-President; Rev. T. M. Harris, Corresponding Secretary; Samuel M. Barnside, Esq. Recording Secretary.

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American Academy of Arts.

At a meeting of the American Academy of Arts, held in December, 1812, the following gentlemen were admitted honorary members:

John Singleton Copley, Esq. of *London;* Gabriel W. Stuart, Esq. of *Boston;* Thomas Sully, Esq. Rembrandt Peale, Esq. B. W. Latrobe, Esq. D. Edwin, Esq. *Philadelphia;* ——— Guy, Esq. *Baltimore;* William Dunlap, Esq. Samuel L. Waldo, Esq. William S. Leney, Esq. Alexander Anderson, Esq. J. Jarvis, Esq. John J. Holland, Esq. John Dixey, Esq. *New-York.*

It was recommended, and a resolution taken at the same time, that there be an exhibition of paintings, at the academy, in the the city of New-York, in the month of May next.

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Observations on the Weather of the city of New-York, for the months of October, November, and December, 1812.

OCTOBER.

The weather of the month of October was, for the most part, moderate and uniform in its temperature. Considerable quantities of rain fell on the 3d, 4th, 12th, 16th, 23d, 26th, and 28th, accompanied with wind from the N. E. or S. W. The lowest range of the thermometer was on the 9th, when the mercury stood, at 7 A. M. at 46; at 3 P. M. at 55; at 7 P. M. at 54. The highest was on the 16th, when it stood, at 7 A. M. at 64; at 3 P. M. at 71; and at 7 P. M. at 65 degrees.

NOVEMBER.

Though the weather, for the greater part of this month, was remarkably mild and pleasant for the season, the thermometer being frequently as high as 58 and 60, at 3 o'clock P. M. there were several days in which we experienced considerable cold, particularly on the 21st, 22d, 23d, 24th, and 25th. On the evening of the 23d, a very severe gale set in from the S. W. which lasted, with increased violence, until the morning, when the wind came round to the north-west, and the storm abated. Considerable damage was done to a number of buildings in the city, and to the shipping in the harbour; in different parts of the country, also, and to a great extent, much injury was sustained from the same cause. On the 28th and 29th, considerable quantities of rain fell, accompanied with wind, chiefly from the S. E. On the 30th, the mercury stood, at 7 A. M. at 33; at 3 P. M. at 48; and at 7 P. M. at 42.

DECEMBER.

The weather of December was uncommonly mild and pleasant; the thermometer, for the greater number of days, being about 36, at 7 A. M.; at 3 P. M. at 47; at 7 P. M. at 36; and seldom below the freezing point. On the 5th and 6th, a storm from the N. E.; from the 12th to 30th, wind from the N. W. or S. W. On the 31st, the thermometer stood, at 7 A. M. at 35; at 3 P. M. at 44; and at 7 P. M. at 40: wind easterly.

Quarterly Report of the Diseases which prevailed in New-York, during the months of October, November and December, 1812.

Fevers of the intermittent character, noticed in our last report, were occasionally met with as late as the months of October and November. In two cases they attacked per-

sons far advanced in life, exhibiting in their invasion symptoms of an affection of the brain, which might very properly be denominated the *apoplectic* state of intermittent fever. By blood-letting and blisters, those more alarming symptoms were removed, when the disease readily yielded to bark, wine, and stimulant nourishment.

In another case of intermittent, the disease assumed the form of the double tertian, (tertiana *duplex*) : In this case, the patient being considerably advanced in life, and having for some years past lived in the too free use of vinous and spirituous drinks, the stomach became so irritable that he could scarcely retain the nourishment necessary to sustain him. His strength too was so much reduced, by the daily return of the paroxysms, and the short intermission they afforded, that we considered his life in imminent danger. In this state of things, we had recourse to large doses of bark, administered by injection, with a sufficient quantity of laudanum to enable the intestines to retain it. These being administered every four hours, the return of the paroxysms was prevented, and the same prescription being continued a few days, the patient was entirely restored. This mode of administering the bark is noticed upon this occasion, for the purpose of recalling the attention of the practitioner to this too much neglected mode of exhibiting this valuable febrifuge. To these febrile diseases succeeded the usual inflammatory complaints of the autumn and winter.

We have again had occasion to remark the beneficial effects of an active antiphlogistic treatment in the *forming* stage of *phthisis pulmonalis*. In one case, a young lady was attacked with all the symptoms of the approach of this disease : viz.....Pain in the chest, frequent cough, the expectoration of matter manifestly purulent, the regularly formed hectic, returning at mid-day and at night, the circum-

scribed flush of the cheek, &c. &c. Having lost ten sisters with consumption, she indulged very little hope of relief. Her mother, in the full expectation of losing her only daughter, whose attack she considered, in all respects, similar to those that had gone before her, almost hesitated to apply for medical aid; but she at length yielded to the advice of her friends. In this case, as the habit of the patient was naturally full, and her strength not much impaired, the lancet was freely and repeatedly employed: by this alone, her cough, pain of the chest, and expectoration were all sensibly diminished. A large blister was then laid upon the chest, and afterwards occasionally renewed; saline cathartics were prescribed, and an expectorant mixture, of the mucilage of gum arabic and tartarised antimony, was administered in divided doses, so as to produce a degree of nausea, and to relax the surface. Its effects were promoted by tepid drinks, consisting of barley water, toast water, &c. Her diet consisted of those articles which are least calculated to add to the excitement of the system. In a word, the case was treated as pure pneumonia, and the result justified the view we have taken of the disease. For, by the remedies prescribed, all affection of the chest has totally disappeared, and the patient is restored to perfect health. This is not a solitary instance of recovery in this disease from the alarming symptoms which have been related: several others of a similar nature, and followed with the same favourable result, might be added in justification of the practice recommended.

A very alarming case of *hemorrhage from the lungs*, has also occurred in the practice of the writer of this article, in which the lancet and cathartics, aided by occasional opiates and nauseating doses of ipecacuanha, have been advantageously employed. The patient was a female, in the 85th year of her age. In the course of three days she lost by hemorrhage, at the least calculation, two quarts of blood. Very

nearly as much more, in the same period of time, was taken from her arm, when the hemorrhage ceased. She has since recovered, without any injury to her constitution, from the loss of blood she has sustained.

We have before remarked, that the use of the lancet is especially indicated in the plethora of advanced life, when the excretions are necessarily diminished from the diminished action of the excretory vessels. We cannot withhold the expression of our surprise, that this opinion should be resisted by the practitioners of our city, as we observe it has been in a variety of instances; and by men too, whose education and whose opportunities of observation should have given them different views of this subject, and have led them to different practice. In three cases, the writer has been called upon to prescribe for patients who laboured under diseases occasioned by such accumulation in the blood vessels. One was affected with vertigo, great propensity to sleep, numbness of the extremities, and disinclination to exercise, whether of body or of mind: in the second, the great oppression at the chest, cough, and difficult respiration, especially upon the slightest exercise, indicated approaching effusion in the cavity of the thorax: in the third, the patient laboured under pains in the region of the uterus, attended with a discharge of a sharp humour from that organ, excoriating the part over which it flowed, accompanied with hemorrhoids, and frequent inclination to pass urine, in consequence of pressure from the overloaded womb. In the first two of these cases, the menses had ceased, and the patients had passed their 50th year. In the third, the catamenia had been sometime suppressed by cold.

In all these cases, the physicians objected to bloodletting, giving as the reason of their objection, that *dropsy* would inevitably be the consequence of bleeding! But those patients have all been bled, not only once, but repeatedly, and

copiously too, and are now in the enjoyment of better health than they have experienced for years. Is it possible that those physicians have yet to learn that dropsy arises as often, nay, more frequently, from increased exhalation, the effect of an overloaded state of the blood vessels, than from diminished absorption, occasioned by loss of tone in the absorbents; that it may proceed from the want of bloodletting, as well as from the excessive use of that remedy? We have no hesitation to say, that this limited view of the animal economy, this dread of the lancet, in our physicians, serves to fill our obituary with consumptions, apoplexies, palsies, dropsies, and other diseases, the effect of plethora and excessive action.

In confirmation of the correctness of this last opinion, as applied to the treatment of dropsy, we could here relate several instances of *hydrothorax*, *ascites*, and *anasarca*, produced by such fulness of the system, and relieved by bloodletting and other depleting remedies. A gentleman of this city, a Mr. C——l, about sixty years old, was unable to lie down for nearly three months, owing to the accumulation of water in the chest, attended with cough, laborious respiration, and diminished secretion of urine, accompanied, at the same time, with a degree of anasarcous swelling of the lower extremities. But by means of repeated bleeding, and the combination of calomel and squills, the symptoms above mentioned have totally disappeared; and by the subsequent use of tonics, he has so far recovered his strength as to return to his usual active occupation.

In another case, the patient, in his seventy-seventh year, of a plethoric habit of body, has, within the last six weeks, been attacked both with ascites and anasarca combined, attended with all the characteristic symptoms of those diseases. As these were induced from the want of exercise, the patient at the same time taking his customary food and sti-

mulant drinks, the depleting treatment was deemed expedient. Fourteen ounces of blood were accordingly taken from the arm, followed with repeated doses of rhubarb and the sulphate of potash. During the use of these remedies, his usual drinks, which consisted of spirits, or brandy and water, as well as the use of animal food, were continued, but in less quantity than ordinary. The tumour of the belly, and swelling of the extremities, were sensibly diminished by the evacuations procured, and by the subsequent use of chalybeates and other tonics, his health is perfectly re-established.

Among other diseases of the last quarter, and which still continue to prevail, are the *measles* and *hooping-cough*. Hitherto, however, these disorders have been so mild that they have, for the most part, readily yielded to the treatment ordinarily pursued.

In addition to the diseases we have occasion to notice in this report, there is one which especially deserves the attention of the physician : it is partial *palsy*, occasioned by the external application of *arsenic*. A very respectable citizen is at this time confined to his chamber, by a paralysis of the muscles of his right arm and neck, occasioned by the use of that poisonous metal, employed for the purpose of removing an encysted tumour on the side of the neck. The tumour was indeed removed, but the patient, by the long continuance of the application, has nearly altogether lost the use of his right arm and the muscles of the back of the neck, and on that side of it from which the tumour was removed. In consequence of this paralysis, his head has, to a degree, been thrown upon his breast, from an inability in the muscles necessary to elevate it. In all other respects he has been and continues free from disease. Similar facts have come to our knowledge of the injurious effects arising from the application of this mineral, as employed for the purpose of removing supposed *cancerous* tumours. The above case is recorded as a caution to our citizens.

We shall conclude this article with the following notice of two cases of disease, occasioned by the poisonous or deleterious effects of honey, as communicated to the public in November last, through the medium of the Evening Post. We, at the same time, refer the reader to a very interesting memoir upon the same subject, published by Dr. Barton, of Philadelphia, in the fifth volume of the American Philosophical Transactions.

New-York, Nov. 14, 1812.

Dear Sir,

Yesterday morning having been called upon to visit two persons who had been poisoned by eating honey, just bought in the Fly-market, it appears to me proper that some public intimation should be given by you to our citizens, that they may be on their guard in purchasing this article.

It is not unusual for WILD honey to be poisonous, in consequence of the bees feeding upon the flowers of poisonous plants, such as the different species of kalmias or dwarf laurels, with which our woods abound; but it is not usual that DOMESTIC honey, produced in the neighbourhood of thickly settled places, should have this effect; such, however, was the fact in the present case. Poisonous honey is, generally, of a dark *reddish*, approaching to a crimson colour, and of a *thicker consistence* than that usually sold in the market; by which circumstance it is commonly designated by hunters, and avoided accordingly; whereas pure or innocent honey is of a light colour, and viscid, excepting when by age it acquires a dark brown appearance.

I found the patients labouring under a great disturbance of the brain and nervous system, violent vomiting, cold extremities, a livid appearance of the countenance, and pulse reduced to about twenty in a minute; but by the vomiting thus spontaneously produced, followed by a dose of castor oil, spirituous fomentations applied to the stomach, bowels

and extremities, and by dilution with warm spirituous drinks, they were relieved from the alarming symptoms which had been produced. Your's, &c.

D. HOSACK.

WM. COLEMAN, ESQ.

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OBITUARY.

DIED—Lately, at the island of *Madeira*, whither he had gone on account of his health, ROBERT WILLAN, M. D. F. R. S. and author of the celebrated work on Cutaneous Disease.

At *Berlin*, in July last, D. C. WILLDENOW, Professor of Botany, author of the Principles of Botany, Genera Plantarum, &c.

In *France*, M. SONNINI, the distinguished Traveller.

In *Dublin*, RICHARD KIRWAN, Esq. F. R. S. L. & E. M. A. I. P. the celebrated Mineralogist.

In *New-York*, on November 15th, 1812, in the 50th year of his age, JOHN KEMP, LL. D. F. R. S. E. Professor of Mathematics and Natural Philosophy in Columbia College.

In the death of this gentleman, the literary world, and especially Columbia College, has sustained a loss of no ordinary magnitude.

He was born at Achlossan, in Aberdeenshire, North-Britain, April 10th, 1763. His early studies were prosecuted with so much ardour and success, that he received in the spring of 1781, the degree of Master of Arts in Marischal College, Aberdeen; and, after a contest which lasted two days, with unprecedented severity, bore away from competitors of high attainment, the prize of the Mathematical Bursary, founded by Dr. Liddell. Before he had reached his 21st year, he was elected a member of the Royal Society of Edinburgh.

Thus enriched with the treasures, and laden with the honours of science, at a period of life when others have, for the most part, acquired only the elements;

and wearing the wreath of victory over antagonists by whom defeat would have been no disgrace, he came to the United States about the termination of the war for independence. His first settlement was at Dumfries, in Virginia. After a short residence in that place, where he had charge of the academy, he came to New-York, and was immediately employed in Columbia College. His first appointment, on the 4th of April, 1785, was to teach the mathematics for one year. At the expiration of the year, viz. on the 17th of April, 1786, he was chosen professor of that branch of study, and engaged *pro tempore*, to instruct the youth in Natural Philosophy. His perfect and undisputed acquaintance with these departments of science, soon led to their combination in him, although originally designed for two professorships. As soon as the news of his appointment arrived in Britain, the degree of Doctor of Laws was conferred upon him unsolicited, by King's College, Aberdeen: He was also chosen a member of the Agricultural Society in the state of New-York, at the constitution of that body.

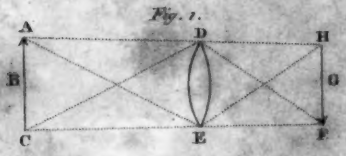
His occupations were now sufficiently extensive and laborious: but, notwithstanding, he accepted on the 8th of May, 1795, the additional charge of Professor of Geography, History, and Chronology, the functions of which new trust he continued to exercise, without relaxing his other Academical labours, until he found his strength unequal to efforts from which his inclination never shrunk. His duties, as Professor of Mathematics and Natural Philosophy, he performed until his fatal sickness, with an alacrity of zeal, and a patience of labour, seldom equalled, never surpassed. His course of instruction requiring constant modification from the discoveries and improvements continually making in physical science, demanded and received, a rigour of application, which he carried to every practicable, and to many an imprudent length. His indefatigable industry, unaccompanied with suitable precaution for the preservation of his health, probably laid the foundation of that disease which took him from us, and accelerated the termination of his valuable life. His place cannot be easily supplied. Good mathematicians are few, experimental philosophers are fewer: but the union of both in the same individual is rare and unfrequent.

With the full sense of their loss, the trustees of the college cannot but find some consolation in the benefit which has redounded to the institution and the community, from his uninterrupted services from his twenty-second to his fiftieth year; i. e. the whole of that active life which it pleased God to grant to him. Many a sufferer will bear a tearful testimony to the doctor's benevolence; his other social virtues are known to his friends. We have only to express our unfeigned regret at parting with him in the vigour of his faculties and the height of his usefulness.

NOTICE TO CORRESPONDENTS.

Our readers will perceive that, as usual, we have again considerably exceeded the amount of pages originally proposed for each quarterly number. This we have done, with the view of giving an early insertion to the communications of our correspondents, and of enhancing the value of the Register. Several of our promised articles are yet necessarily postponed until the April number.

For the interesting biography of the late President Johnson, of Columbia College, inserted in our last, and the memoirs of the late Rev. Dr. Miles Cooper, published in the present number, the Editors are indebted to GULIAN C. VERPLANCK, Esq. of this city. Like communications from the same gentleman, will always meet with a prompt insertion in the pages of this work.



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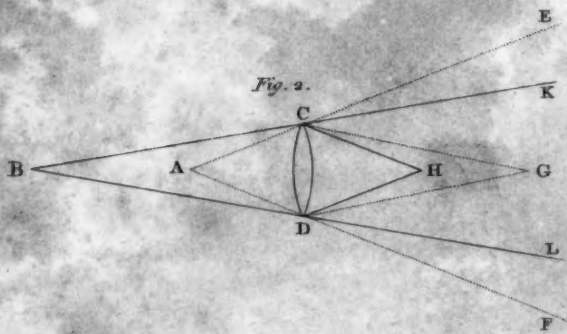

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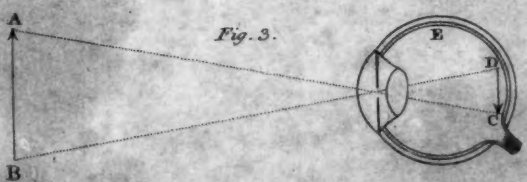

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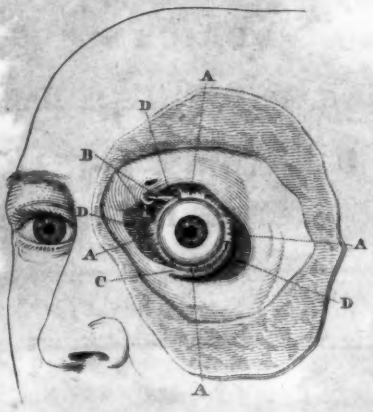
For the Med. and Phil. Register.



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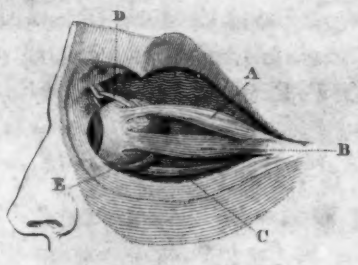

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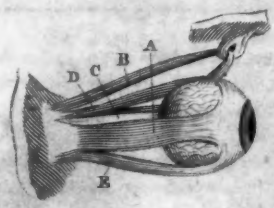

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For the Med. and Phil. Register.